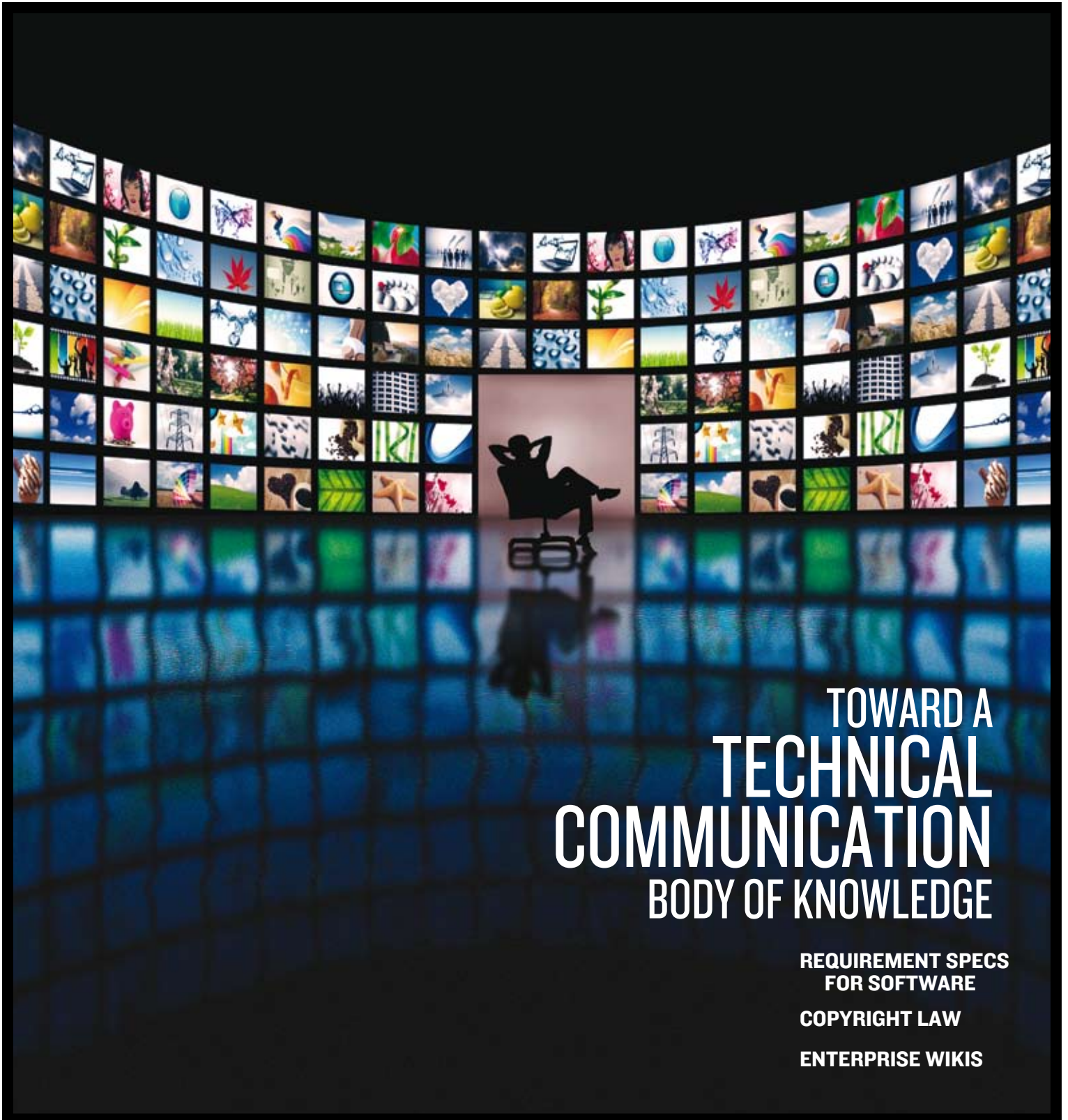


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Volume 57 Number 1

Technical COMMUNICATION

Journal of the Society for Technical Communication



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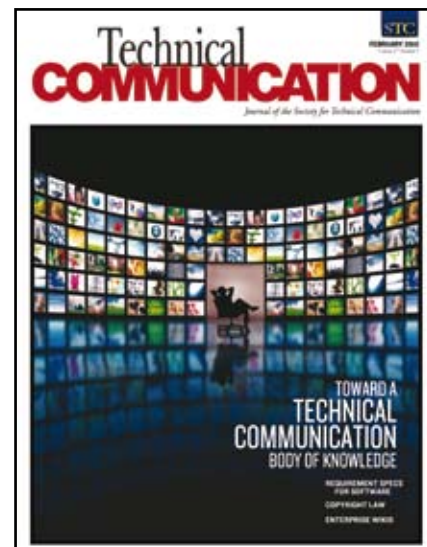
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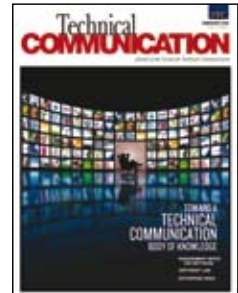
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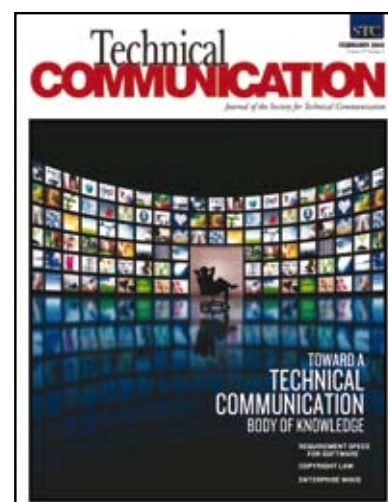
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Redesigning *Technical Communication* ... Behind the Scenes



“From the moment that readers pick up this first redesigned issue, it will be apparent that this is definitely not the same old *Technical Communication*.” This is a quote from the August 1997 editorial by George Hayhoe, introducing the former redesign of this journal. Indeed, the changes made were spectacular back then. Thirteen years later, a similar sentence could be used to introduce the current issue of *Technical Communication*. It is the circle of life applied to graphic design.

In my November 2009 editorial, I had to leave you with many uncertainties about the way *Technical Communication* would develop in 2010. Essentially, the plan was to transform a hybrid journal (print plus online) into a somewhat less hybrid journal (online plus print-on-demand), to take the opportunity to further improve the presentation of articles, and to drastically improve the journal’s online presence. Much has happened since then. I am proud to present the new format of *Technical Communication* to you. Now that all anticipated changes have materialized, I realize that the changes made may actually look overwhelming. Let me tell you the story behind the journal’s redesign.

By the end of December, STC signed a contract with

EEI Communications for the production of the online journal. About the same time, a small redesign task force was formed with four Editorial Advisory Board members—Thomas Barker, Avon Murphy, Ginny Redish, and Kirk St. Amant. The goal was twofold. A design format would be developed for our print-on-demand subscribers and for the institutional subscribers who have access to the journal via the Ingenta Web site, with PDF and HTML versions of all articles. For the STC members, a more comprehensive and interactive online presence would be developed for the STC Web site. The process started with the layout of PDFs.

Several professionals at EEI Communications contributed to the redesign of *Technical Communication*. Alix Shutello was the senior project manager involved. She was the one who supervised the process, contacted all parties involved, helped us make difficult decisions, and meet deadlines. Erika Abrams, an experienced graphic designer with expertise on campaigns, magazines and books, was responsible for the page design. Jason Watkins, a graphic designer who has led the redesign of a dozen newspapers and magazines throughout the USA, did the cover design.

I just suggested that the story began in December 2009, but in fact it started as early as in December 2007, long before I even dreamed of becoming the editor of *Technical Communication*. At that time, an outstanding STC Task Force on Publications presented its final report to the STC Board. This task force consisted of Ginny Redish, Thomas Barker, Carol Barnum, Susan C. Becker, Michelle Corbin, and George Hayhoe. Their report provided many insightful recommendations to improve the journal. Ever since, we had been waiting for an opportunity to implement their recommendations. This year’s transformation of *Technical Communication* was the ideal opportunity to do this.

The recommendations by the STC Task Force on Publications covered many different aspects of the journal—editorial policy, content alerts, online features, and article format. The recommendations in the latter category included a redesign of the layout of articles, the use of structured abstracts, and the introduction of a “practitioner’s takeaway” at the beginning of each

article. These were suggestions we readily adopted for the new format.

The process that followed made me aware of several characteristics of these types of redesign processes. First, throughout the process it appeared to be essential to have concrete design examples to react to and talk about. Building on the original article layout and the specific aspects we did not like (anymore), examples of other online journals we liked, and general wishes and demands about the content and look-and-feel, Erika Abrams made rapid prototypes of the page layout of an article, and the Book Review and Recent & Relevant sections. These first versions proved to be crucial for us all to be able to fruitfully discuss our preferences.

Second, it was a privilege for me to be part of a team of technical communication experts and witness the body of knowledge that is actually present in the minds of technical communication professionals and scholars. All four members of the redesign task force as well as the other Editorial Advisory Board members—Michelle Corbin, Caroline Jarrett, Carolyn Rude, Karen Schriver, and Sherry Southard—impressed me with the insights they shared about designing a journal. Their insights reflected their ability to take the perspective of potential readers, as well as their knowledge of relevant research findings on graphic design and document use. To me, the process illustrated how research findings can be an integral part of technical communication expertise, and how specific findings can be used to inform design decisions.

Furthermore, the process showed how different experts can

really complement each others' contributions and build on each others' comments. It made me aware of an important shortcoming in earlier research. On the basis of several studies I conducted in the past, all analyzing and comparing feedback given by individual experts, I used to say that experts disagree. Disagree about what? Well, about everything. My experience in this process led me to rephrase this position: experts complement each other. It would be a wonderful exercise to further study how technical communication expertise manifests itself in collaborative processes.

Third, the old technical communication adage "keep it simple" was one of the recurring themes in the feedback given on the page layouts. In all cases, the page layouts we ended up with were considerably simpler than the initial ones—simpler in terms of fewer different fonts used and more consistency between sections. In such processes, simplicity is not something you start with, it is what is left after all unnecessary complexity has been removed.

In my next editorial, I will be able to say more about the development of *Technical Communication's* online presence on the STC Web site—a process that is still going on at the moment I am writing this. Let me conclude by citing George Hayhoe's 1997 editorial again, because it applies to this redesign as well as it applied to the 1997 redesign: "Although the majority of the redesign work has now been completed, we expect there will be some tweaking over the next several issues before we will be able to say the job is finished."

In this issue

This issue of *Technical Communication* contains four articles. In the first article, Nancy Coppola documents the Technical Communication Body of Knowledge project (TCBOK) and its history. What a great way to start the journal in 2010. Ever since I heard about this landmark project, I have asked members of this group for a contribution in *Technical Communication*. Nancy Coppola volunteered to write this first paper, focusing in particular on the process.

In the second article Brian Ballentine discusses the benefits of using narratives in software requirements specifications. In the context of the design process of a Web-based radiology application for the medical industry, he demonstrates how the use of narratives may contribute to the functionality of software. The third article, by Martine Courant-Rife, draws attention to issues of copyright, plagiarism, and authorized and unauthorized use in Web-based communication. She studies the knowledge and understanding of technical communication teachers and students on these topics, both quantitatively (survey) and qualitatively (interviews), and identifies several misunderstandings. The last article in this issue is by Christian Wagner and Andreas Schroeder. The article, which is based on a thorough literature study, discusses the use of enterprise wikis for collaboration and communication processes within organizations.

The Technical Communication Body of Knowledge Initiative: An Academic-Practitioner Partnership

Nancy W. Coppola

Abstract

Purpose: This article chronicles the STC Technical Communication Body of Knowledge process from 2007 to 2009 and provides key elements of a landmark project to develop a body of disciplinary knowledge.

Method: The author, who is a member of the Body of Knowledge Task Force, documents the chronology of the project through firsthand accounts. A brief review of literature helps to place this initiative within the context of technical communication professionalization and identifies its uniqueness from previous efforts.

Results: The project demonstrates a productive partnership between practitioners and academics. It promises to help technical communicators assess their own level of knowledge and skills, provide easily accessible information for those wanting to hire technical communicators or enter the profession, and define the profession as a specialized set of skills, abilities, and knowledge.

Conclusion: This project laid the groundwork for a body of knowledge that has the potential to establish technical communication as a true profession.

Keywords: Body of knowledge; Academic-practitioner partnership; Professionalization; STC history

Practitioner's Takeaway

- The TCBOOK demonstrates how practitioners can use research strategies of mind mapping, card sorting, affinity diagramming, and shareholder analysis to solve workplace problems.
- Technical communicators must continue to validate the TCBOOK framework and enable a value proposition that resonates with employers and credits practitioners for their professional contributions.

Introduction

The divergence between academics and practitioners, the lack of a coherent knowledge approach within the academy and the workplace, and the desire for unity among shareholders—these are the challenges in defining the technical communication body of knowledge and developing a framework for compiling

it. The tensions, present since the founding of the Society for Technical Communication (STC), are enduring. At the present writing, however, we have an opportunity to achieve a structural framework for joining the divergent knowledge bases of academics and practitioners and creating a coherent body of disciplinary knowledge.

This article documents STC's Technical Communication Body of Knowledge (TCBOOK)

The Technical Communication Body of Knowledge Initiative

Nancy W. Coppola

initiative, an effort of many to resolve seemingly archetypal tensions within our profession. Both practitioners and academics recognize the importance, and the struggle, of establishing technical communication as a fully mature profession. Teresa Kynell-Hunt and Gerald J. Savage devote two volumes to mediating the issues surrounding professionalization of technical communication: Volume I, *The Historical and Contemporary Struggle for Professional Status* (2003), and Volume II, *Strategies for Professional Status* (2004). Contributors to these volumes provide contending strategies for professionalization of technical communication. Following the arduous path of law, medicine, and engineering for professionalization, notes Marjorie T. Davis (2004), requires our professional societies to set standards and establish minimum qualifications for practice. Robert R. Johnson (2004) argues for a professionalization process that orients our field to ethical conduct, stewardship of technology, and social responsibility. Professionalization, according to George Hayhoe (2003a), requires that academics and practitioners develop a shared understanding of theory, research, and practice.

Common to all strategies, however, is building a unified body of knowledge, or the complete set of concepts, terms, and activities that make up a professional domain. In its report to STC, *Change Management Solutions* (2008) examines how other professions successfully evolved, noting that a prerequisite is an identifiable and independent body of knowledge. Kenneth Rainey (2005) has long argued for “codification of the bodies of knowledge through the development of an encyclopedia of technical and professional communication” as the first step toward professionalism. Johndan Johnson-Eilola and Stuart Selber (2001) agree, insisting that our field will not achieve the status of a mature profession until it can come to grips with a coherent body of disciplinary knowledge.

Our potential to establish a disciplinary body of knowledge has long been present. Hopeful predictions of who we are and what we need to know to succeed have been common for more than a decade. “But when the STC job competencies committee fulfills its mission, we will be able to proclaim clearly who

we are, what we do, and how we make a difference.” Such was the 1995 proclamation of the job competencies committee established by then-STC President Saul Carliner (Daniels, 1996). STC, as our largest professional organization, has led the way in dedicating effort and resources to the complex task of unifying the profession by establishing a body of knowledge (Turner & Rainey, 2004). Why, then, is this initiative different? The current TCBOK effort is unique because it separates the process of building a disciplinary knowledge base from the process of professional certification for technical communication. The team decided that certification is a separate effort that may make use of the body of knowledge, as will many other individuals and groups, but is not within its scope. This time, STC, a practitioner-oriented organization, made a serious effort to incorporate academics into the process, recognizing the value of theory and research to a robust knowledge base. Finally, as this article demonstrates, maturation of technology and proliferation of tools allowed for a virtual community of this magnitude and complexity.

This article documents the TCBOK project and history. It begins with the vision-forming process, July–December 2007; moves through Phase 1, establishing the framework for the knowledge portal, January–May 2008; Phase 2, refining the framework for the knowledge portal, June 2008–April 2009; and concludes with Phase 3, developing governance, strategy, and change management, May 2009–September 2009. This chronological framework, which is shown in Figure 1, constitutes the body of knowledge story.

Prologue: Re-envisioning the Body of Knowledge, July–December 2007

The current project was born in the summer of 2007. Acting on a proposal by Hillary Hart, University of Texas, Austin, the academic-industry liaison, STC invited leaders from its organization, industry, and technical communication programs in universities to prepare for a critical topics summit that was to strengthen the relationship

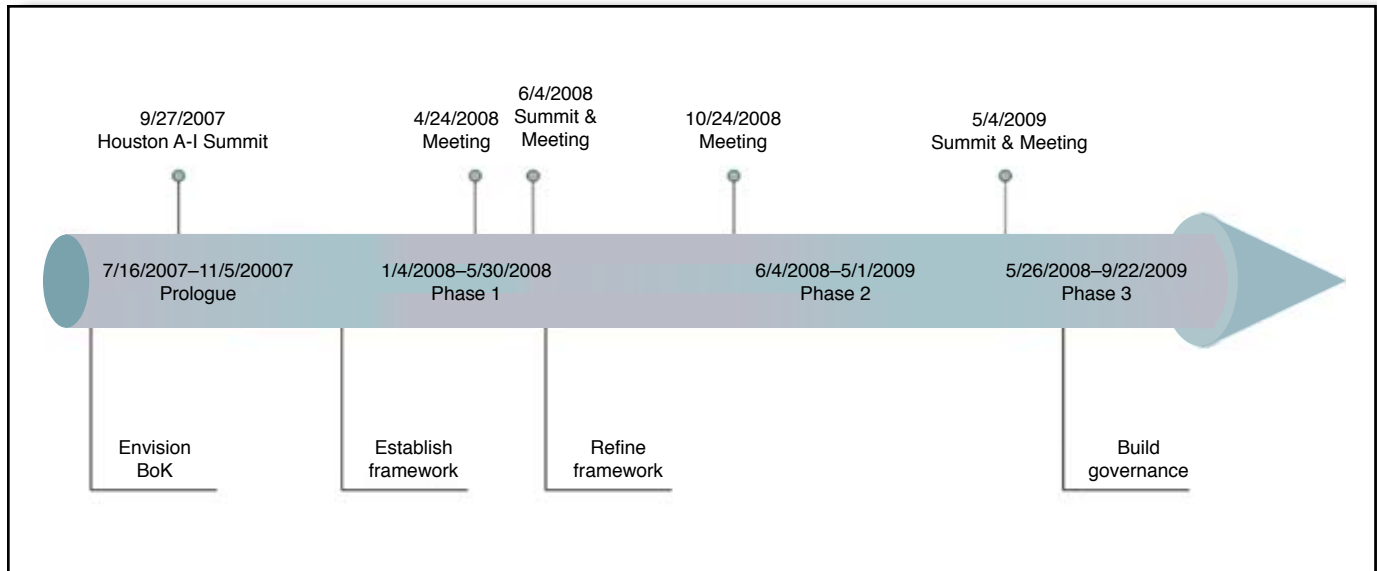


Figure 1. Technical Communication Body of Knowledge Project Timeline

between academic and industry practitioners. One of the five critical topics was defining a body of knowledge for technical communication. Chaired by David Dayton, Towson University, this group (Marjorie T. Davis, Mercer University; Sandi Harner, Cedarville University; Hillary Hart, University of Texas, Austin; Paul Mueller, UserAid; Ellen Wagner, Adobe) prepared for the summit by establishing prior research on a rationale for a body of knowledge and the approaches that other professional associations have followed in the process.

On September 28, 2007, the five teams met at the University of Houston-Downtown for the Academic-Industry (A-I) Leaders Summit. The TCBOK team presented recommendations emerging from its pre-summit research and online conversations in stikipad.com, a now-defunct hosted wiki tool (Dayton et al., 2007). The team recommended that the TCBOK should

- Separate its efforts from any certification and/or accreditation efforts. Not only was a separate STC-supported team examining certification, but the TCBOK group hoped to develop an objective knowledge base outside the certification polemic. We feared that putting the horse before the cart

would result in a process that emphasized products for accreditation rather than a process of discovery.

- Adapt the open, collaborative model for development set by the Usability Professionals Association (UPA) and its body of knowledge (Usability Professionals Association, 2008). Rather than a formal, codified system, we sought the model of a flexible repository that is relevant to the needs of the discipline.
- Collect and analyze existing frameworks in other professions for categorizing and defining knowledge, skills, and attitudes. Technical communication shares critical similarities with other professions whose services are consumed across a wide range of disparate industries and commercial activities, and that faced competition from overlapping professions and underwent radical redirection within the last 25 years. We sought to identify and learn from those commonalities.
- Emulate academic-industry collaboration represented by ABET, Inc. (formerly Accreditation Board for Engineering and Technology). We realized that only through the shared expertise of practitioners and academics would TCBOK be able to define the profession by the outcome achieved rather than by functions performed.

The Technical Communication Body of Knowledge Initiative

After the summit, STC President Linda Oestreich appointed Hart and Dayton to co-chair a task force by organizing a charrette, a design workshop for 15 practitioners and 15 academics to take place in first quarter of 2008. Instead, budgetary constraints forced a change of plans; the STC Board of Directors approved funding a group of 10 that would work online for several months and then meet face to face.

This remains, however, a pivotal moment in our story: academics and practitioners found common ground and a willingness to push forward.

Phase 1: Establishing the Framework for the TCBOK Portal, January–May 2008

Setting: Walking the Wall

The TCBOK Task Force began its work at the turn of a new year in 2008 in a virtual asynchronous meeting space, Basecamp, a Web-based project management tool for collaboration. The task force consisted of five industry and five academic practitioners, whom Hart and Dayton recruited, and included Hart and Dayton: Alex Blanton, Microsoft; Kelli Cargile Cook, Utah State University; Nancy W. Coppola, New Jersey Institute of Technology; Marjorie T. Davis, Mercer University; Mark Hanigan, On the Write Track; Michael A. Hughes, IBM Internet Security Systems; Janice (Ginny) Redish, Redish & Associates, Inc.; and Daphne R. Walmer, Medtronic, Inc. Our task was to jump-start the process of creating a body of knowledge for the technical communication profession.

Hart and Dayton immediately focused us on our goal of drafting project documents—a purpose and rationale statement, audience personas and scenarios of use that represented primary user groups envisioned by the team, students, and a high-level outline of the technical communication body of knowledge with a draft of information architecture. We all needed help understanding how to create, manage, link, and find information within this new knowledge space. Dayton prepared a screencast with Jing software in which he narrated a quick tour of the Basecamp site (2008a).

The new team of 10 collaborators was aware of the enormity of the task and its possible historic

importance. From our first days, we knew that only a Web-based portal would be able to bring together the dynamic and diverse core components and myriad specialty components of technical communication. But the challenge of how to go about creating even the highest-level outline and information architecture proved daunting. Each of the task force members came to the goal with widely varying knowledge and skill sets. There were postings on taxonomies and methodologies, on learning styles and content strategies. From research to project management, in phone conferences and in Basecamp, we 10 floundered, each of us speaking rather different languages. We spent a good deal of time trying to figure out what to call this thing we were creating—Web of Knowledge, Map of Knowledge, Network of Knowledge, Knowledge Portal—a conversation that covered up the underlying tension of our divergent knowledge bases through convenient metaphors.

Enter Ginny Redish, whose calm, expert voice posed a simple question: Who is the audience for the knowledge portal? This was, as they say, an “aha” moment. Aim trumped metaphor, and we were on our way.

Mike Hughes took the lead in identifying and describing groups with a stake in defining a body of knowledge for technical communication (2008). Dayton jumped in and analyzed Hughes’s table of stakeholders to draw out high-level user goals that the TCBOK might serve as a first step toward creating personas and scenarios. Using Writeboard, a wiki feature of Basecamp, and following Redish’s storytelling guidelines (2007) for developing personas and scenarios, the team began to describe the people who would use a disciplinary body of knowledge. We were galvanized by our tasks—each of us could imagine ourselves as users of the knowledge portal. For example, one user type is the technical writer who wants to keep current with the field. To make this user type realistic, Redish posted a slide deck with examples and templates for persona development (2008) that included key attributes, daily tasks, fictional career details, informational needs from the body of knowledge portal, and then a typical task that the user might perform in the knowledge portal. Thus, a task scenario for this typical user was: A veteran

practitioner goes to the TCBOK wiki looking for guidance on how to implement structured authoring as a first step toward a transition to single-source publishing.

Davis and Hart drafted the initial framing document that would describe why defining a body of knowledge is necessary. Their purpose and rationale statement is worth quoting here (2008):

First of all, a profession cannot be recognized as a profession until it is defined as such. Engineers, for instance, have a body of knowledge they must master before they can practice as engineers.... Although technical communicators may not yet want such a highly codified and subdivided set of skills and practices, we do need an authoritative place to find answers to that eternal question: “What do technical communicators do, anyway?” New practitioners need to see their professional development pathways spelled out, along with concomitant educational/training opportunities. Veteran practitioners need a means for assessing their progress and determining what additional training they may need. Or they may simply need quick access to guidelines for new techniques and technologies.... And executives, who may never have heard of technical communication, need a place to find out what it is that TCers can do for their company.

Secondly, many recent studies of technical communicators show that writing is just a part (and sometimes a small part) of what successful technical communicators actually do. In Hart & Conklin’s co-authored survey [2006], only 8 out of the 75 responses listed “writer” as a unique identifier. Our data show that communicators seem to be spending about the same amount of time on communication *processes* as they are on

creating end-user documents or *products*.

If we want to maximize our value to the business functions of corporations and agencies, we need a body of knowledge that will make that value clear to employers. STC has recently petitioned the U.S. Bureau of Labor Statistics for a re-definition of technical “writer” to technical “communicator.” Citing TC as a growing field with many jobs coming online in the future, the petition describes how limiting and inaccurate the term “writer” is.

The First Weekend Workshop

With the rationale, conceptual overview, value proposition statement, and personas and scenarios in good draft shape, we met in Herndon, Virginia, near STC headquarters on April 24–26, 2008, to develop consensus on the design artifacts for the preliminary information architecture.

The nine TCBOK members who attended the weekend workshop, along with ex officio member Lloyd Tucker, STC director of education and membership, worked to develop a taxonomy from the bottom up through affinity diagramming, a popular project management technique. As our facilitator, Redish came to the meeting with a card set of more than 100 sticky notes with nouns (for example, *indexing*, *agile development*, *usability*) from individual maps of content topics that several of us had created over time (Coppola & Elliot, 2007; Davis, 2008; Dayton, 2008b). In this card-sorting activity, she asked us to arrange the sticky notes on a wall in any order that made sense to us. Divided into teams, each with one-third of the cards, we began to walk the wall, sorting, grouping, and labeling with liberal application of our sticky notes. Slowly, the hierarchy emerged. We concurrently sifted the content categories through the STC Special Interest Groups (SIGs) and even the STC Summit conference tracks to make sure we covered all the bases.

In the afternoon, Redish reminded us that we needed to move from a content focus to our user focus. This time, using our personas to role play, we walked the wall again, taking the perspective of our archetypal users.

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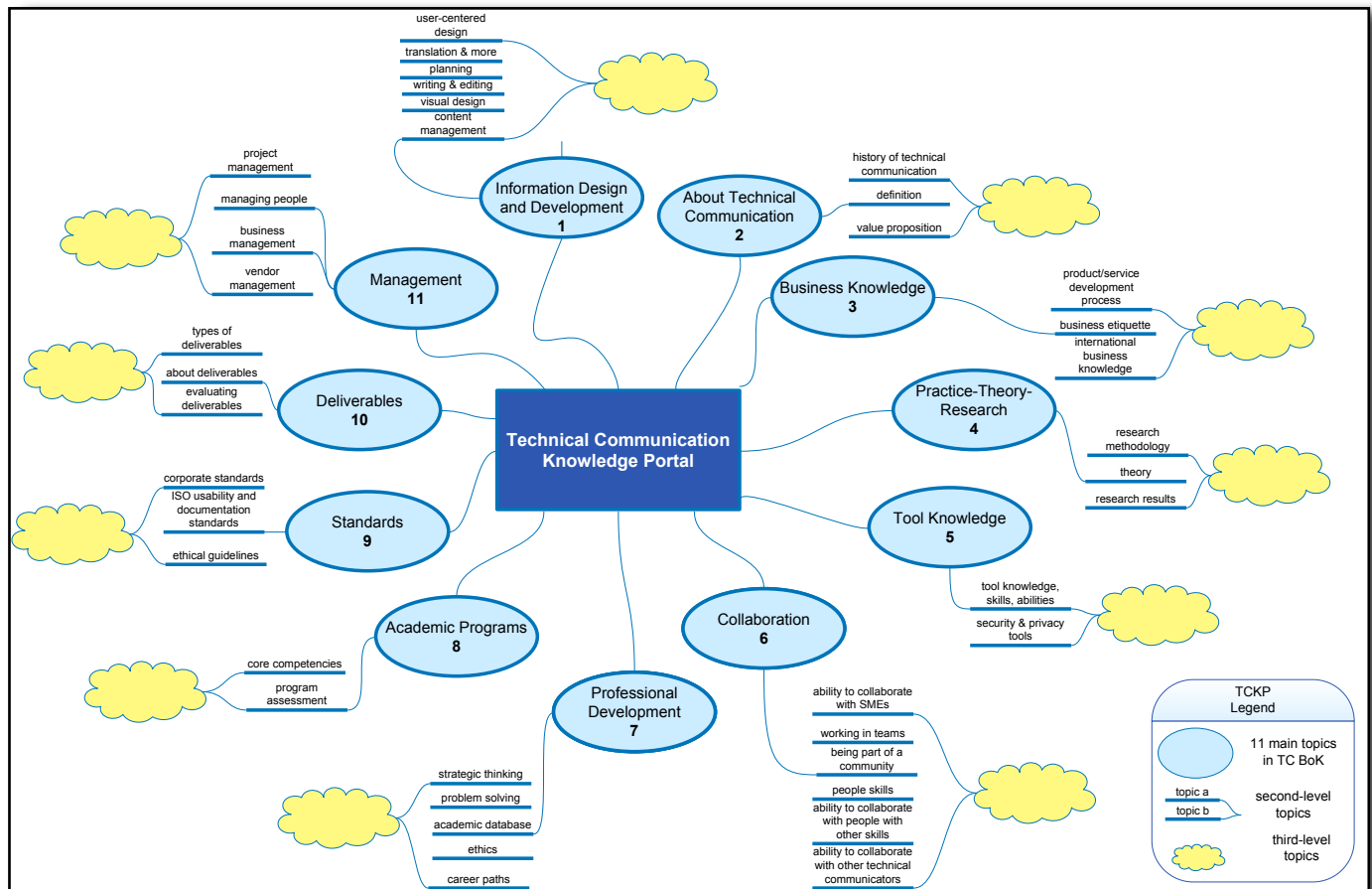


Figure 2. Mindmap of the Technical Communication Knowledge Portal Showing 11 Main Topics and Second-Level Subtopics

How would our shareholders use this map? What were the big categories and how could they be found?

At the end of the day we had, as Hughes said, “netted the beast.” We had a taxonomy of the knowledge portal for technical communication. At this first stage of a long process, we had defined what we were trying to create as a conceptual framework, the high-level taxonomy that tags and illustrates the interrelationships of components of the body of knowledge in technical communication.

After a facilitated review of the wall by STC Executive Director Susan Burton and Chief Operating Officer Diana Buttram, we left the workshop with agreement on the name *TC Knowledge Portal* for this stage of the project and its general outline and taxonomy. I went home with the hierarchy of

sticky notes carefully transposed from the affinity-diagrammed wall and taped to 12 flip-chart sheets. My task was to create a one-page visual diagram of the more than 100 topics and subtopics we had identified. The Visio diagram, Figure 2, “Mindmap of the Technical Communication Knowledge Portal,” shows the 11 main topics with their second-level subtopics and a cluster representing the third-level traits and characteristics. Figure 3 demonstrates one of the main topic areas, “Information Design and Development,” with detailed second and tertiary levels of content.

Following the April meeting, the STC Board of Directors sought member feedback to the preliminary work of the TCBOK Task Force through one of its periodic Web-based Knowledge-Based Governance surveys. Prior to the May 2008 board meeting, a survey

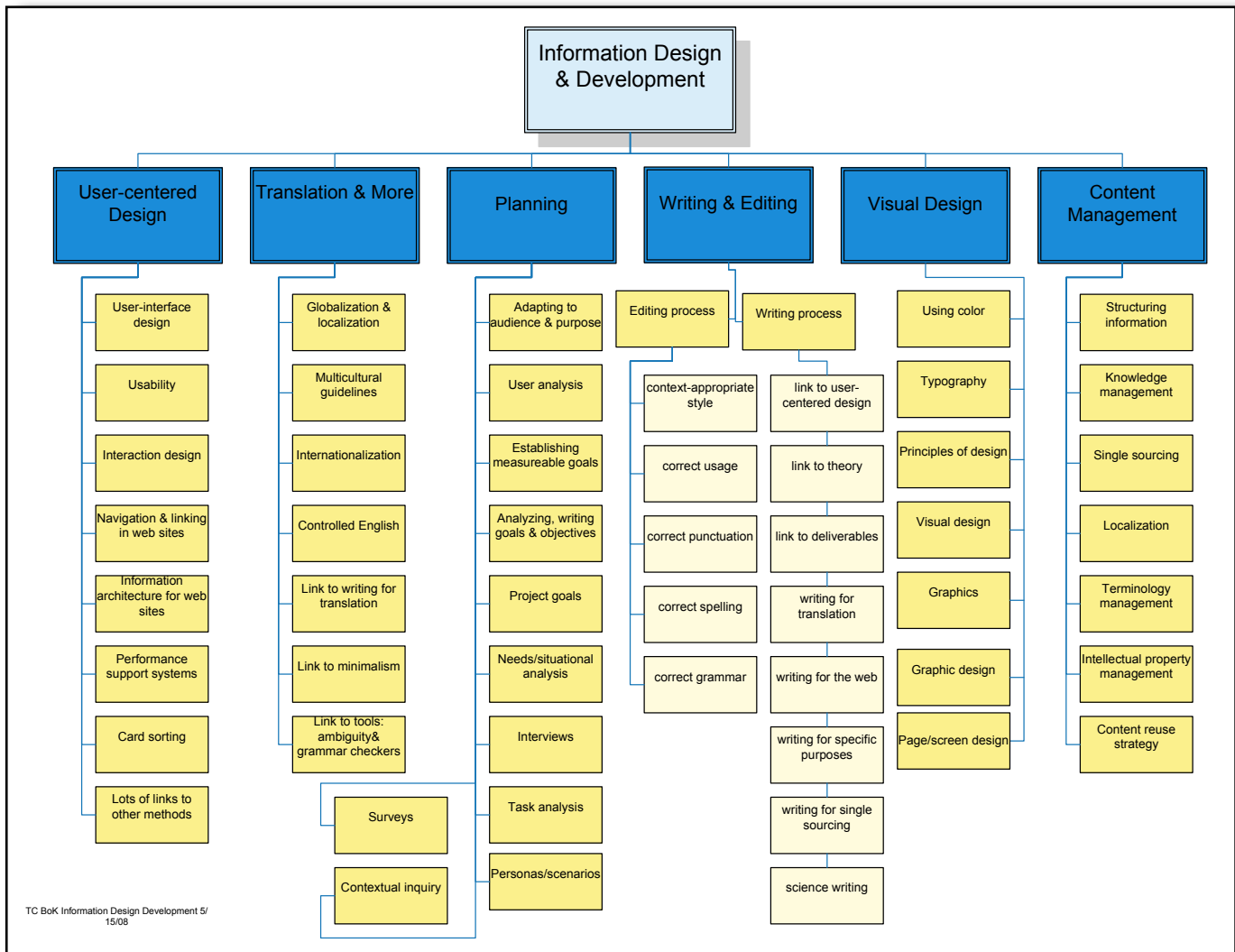


Figure 3. One of 11 Main Topics in Mindmap (Figure 2) With Detailed Content

emailed to members included a table of the top-level topics of the draft knowledge portal site map. In defining the profession, respondents rated four topics as extremely important: information design and development; collaboration; business knowledge; and deliverables (Dayton, Hart, Hughes, & Redish, 2008).

Preparation for Summit 2008

During the next weeks, the team prepared for the STC Summit 2008, June 1–4, Philadelphia, Pennsylvania. With the goals of eliciting feedback, populating the map with

content, and validating the current content, the TCBoK Task Force created the following conference artifacts.

Borrowing from the successful affinity diagramming event described earlier, a “Walk the Wall” system allowed the portal map to be interactive. Tucker developed the wall-size graphics of the overall 11 main topics (Figure 2) and the in-depth individual maps of the 11 topics as indicated by Figure 3. This draft map of the TC Knowledge Portal was displayed at STC Central in the Exhibit Hall along with stacks of sticky pads and free STC pens to encourage conference attendees to post their comments and feedback.

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Throughout the conference Burton, Oestreich, and the TCBOK Task Force exhorted conference attendees to “walk the wall.”

So that attendees would have a takeaway and a reminder to volunteer, we developed a TC Knowledge Portal Handout. Distributed at sessions and at STC Central, the handout gave the project rationale and overview, a value proposition statement of the profession that resonates with employers so that practitioners can gain credit and professional acclaim for their contributions, and contact information. It also included four personas and scenarios that represented primary audience groups envisioned by the team: practitioners, managers, students, and instructors.

Further, two summit presentations provided information and sought feedback on the initiative: (1) “Technical Communication Body of Knowledge I: A Framework for Moving Forward” (Dayton et al., 2008), a progress report on the first steps; and (2) “Technical Communication Body of Knowledge II: Open Forum for Discussion and Feedback” (Coppola, Davis, & Hanigan, 2008), a follow-on session designed to give conference attendees an opportunity for feedback.

At the end of the conference, TCBOK Task Force members had talked to hundreds of attendees, gathering their insights and input. Dayton harvested sticky notes from conference attendees and collated the comments in an Excel spreadsheet. Each of the 11 top-level domains of the TC Knowledge Portal was tabbed in an Excel file with text denoting comments and suggesting new topics.

And so we had come to a milestone moment in STC history. We had, collectively, developed a high-level framework for a body of knowledge that was preliminarily validated by the membership. We emerged with a more unified team spirit.

Phase 2: Refining the Framework for the Knowledge Portal, June 2008–May 2009

At a June 4, 2008, meeting with the STC Board of Directors in Philadelphia, the original TCBOK team was expanded and reconfigured. Hart and Hanigan signed up as the 2008–2009 co-chairs, Caroline Jarrett, Effortmark, UK, joined on as the project manager, and

Connie Kiernan, United States Mint, and Rob Hanna, ASCan Enterprises, became communication managers. The Phase 2 goals for the project were to collect, analyze, and implement input to redesign and perhaps reconceptualize the draft site map.

This next phase ushered in new tools for collaboration, many more channels for collecting feedback, and new volunteer team members with fresh perspectives and zeal. In order for the original static diagram of the overall knowledge portal to be interactive and dynamic, it was moved to a Web-based environment. STC funded a subscription to CoMapping, an application based on mind mapping. This tool brought a visual interface showing connections between blocks of information text to our map along with real-time collaboration and updates. Hanna consolidated each of the domain maps provided earlier into a single aggregated map and ported data from each of the 11 domain maps individually for easy linking when published.

Portal Map Published on Web

With the TC Knowledge Portal Site Map published, we could now solicit feedback through these channels:

- Member feedback from survey: September 30, 2008–November 10, 2008. Kiernan led development of a two-part survey, shown as Figure 4, that was posted on the STC Web site. The survey, which was emailed to all STC members as well as posted to other professional organization listservs, asked members first to respond to the collective personas and scenarios and then to review the individual domains in the site map. About 150 STC members dedicated an hour on average to provide very detailed and thoughtful comments on the survey.
- Feedback from other organizations: September 2008–October 2008. We promoted the survey on professional listservs (Association of Teachers of Technical Writing [ATTW], Council for Programs in Technical and Scientific Communication [CPTSC], and Writing Program Administrators [WPA]) and in special sessions at the International Professional Communication Conference (IPCC) in Montreal (July 13, 2008, led by Hart) (Davis &

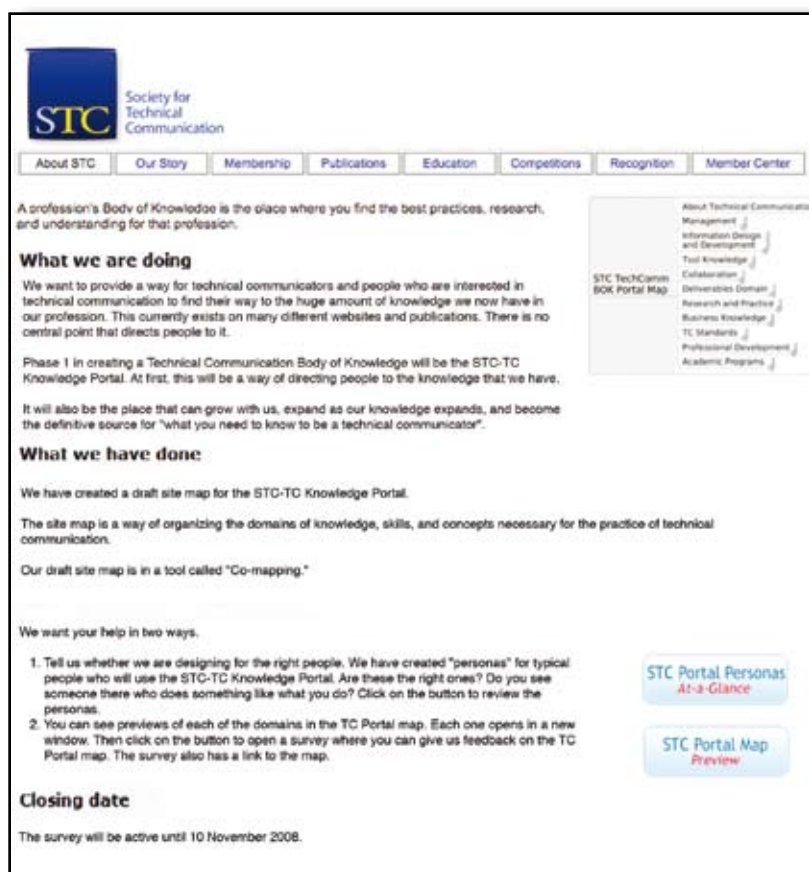


Figure 4. Survey Posted on STC Web Site Seeking Member Feedback on TC Knowledge Portal

Hayhoe, 2008) and at CPTSC (Coppola, 2008). The goal at these sessions was to demonstrate the generic value of the TCBOK initiative to help technical communicators assess their own level of knowledge and skills; provide easily accessible information for those wanting to hire technical communicators or enter the profession; and define the profession as a specialized set of skills, abilities, and knowledge.

The Second Weekend Workshop

With hundreds of collected comments from these many different resources, our task—to develop a pathway for people interested in technical communication to find and navigate the huge amounts of knowledge in our profession—had just become far more complicated. Another face-to-face meeting was in order. This time,

we (Saul Carliner, Concordia University, Coppola, Hanna, Hart, Hanigan, and Kiernan) traveled to the STC headquarters, then in Arlington, Virginia, for a meeting on October 24, 2008. We were joined by STC staff Lloyd Tucker and Shaf Syed, Webmaster, and Caroline Jarrett by phone from the UK. Our agenda was to identify the tasks needed to wrap up the site map activity, including analyzing and incorporating the received comments, to plan the deliverables for the 2009 STC Summit, and to think about the direction after the summit.

Initial survey feedback on the TC Knowledge Portal told us that encountering 11 domains was just too confusing. We decided on a more focused entry to the portal that organized the 11 domains into four overarching classifications. Therefore, a person coming to the portal would find (1) About Technical Communication; (2) Managing Your Career; (3) Producing Technical Communication; and (4) Advancing Technical Communication Through Research and Practice. The new team structure included volunteer teams from academe and industry with a leader and a TCBOK Steering Committee that took the lead at the four top levels of the structure. We also began to codify the information architecture with these terms: Domain—high-level areas of knowledge under which are organized skills and knowledge areas specific to technical communication; Node—second-level skills and knowledge areas; and Knowledge Element (KE)—specific knowledge elements that will be linked to sources of information (articles, original content, other Web sites, etc.). Figure 5 shows the information architecture of the knowledge portal map.

By the turn of a new year in 2009, the domain teams were busy vetting comments and survey feedback into individual domains on the CoMapping site. A technology team was working on finding a more collaborative editing tool, and the steering committee was grappling with a way to structure the

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Figure 5. Information Architecture of TC Knowledge Portal Map Created with CoMapping Software

internal DNA of the portal map. As we dug deeper into populating the framework, talk of certification arose. As noted earlier, our original tenet from the A-I Leaders Summit was to avoid conflating the TCBOK and plans for certification. And with no procedure for managing changes to the portal, differences about ownership arose. One steering committee member suggested creating domain titles as verbal phrases that reflect what a technical communicator would want to do with this area. For example, the domain Academic Programs would become Finding Academic Programs because a user would want to know how to find an academic program. The team spent a good deal of time hashing out the semantics of naming—a dialogue, as noted in Phase 1, that covered up underlying tensions. With questions about rigor, inclusion, and flexibility unresolved, no real progress was being made. We became stuck.

Fortunately, another expert voice provided a calm and reasoned resolution. This time it was Davis who created a 9-minute video for her Mercer University distance learning class in the Master of Science in Technical Communication Management (MSTCO) as a straightforward introduction to a project that would involve the students in populating the portal site with

content (2009). But the video also served to remind us about our collective goals for the project. At the same time, a new wiki tool was selected by a committee of four and launched by project manager Jarrett. We put aside semantics and moved into the EditMe wiki with renewed purpose.

A Wiki Saves the Day

Using a wiki presented new challenges for the distributed team. The very nature of a wiki with its bottom-up process of content creation in a linear structure did not easily translate the visual hierarchy of our previous portal map. At the wiki's top level, nested structure became invisible, forcing the

user to go to the node itself to see the structured relationship. Fortunately, in February's monthly conference call, Jarrett offered to lead the wiki team in developing a straw man site with administrative procedures to maintain it.

Therefore, for the wiki top level, the domain leads wrote an overview so that people coming to the page would be able to quickly discern whether they were in the right place to answer their questions. The overview described how that item (Designing and Developing Information, for instance) is defined within technical communication practice and theory: "Designing and developing information describes the processes of defining a technical communication project, determining how the content will be presented, developing and producing that content, and assessing the extent to which the content achieves its intended purpose." Under the overview paragraph, the list of topics provided enough description to guide users.

At the same time, Jack Molisani, ProSpring Staffing, refined the personas based on member feedback from the survey. The 14 personas represented the wide cross-section of people who might come to this encyclopedia of technical communication

content. Kiernan continued to add to her extensive bibliography of reference works and glossary of terms related to technical communication practice. And Jarrett added meta-content pages to the wiki home page so that the project status, history, and personas were integrated and easily accessible.

Summit 2009 Run-Up

By the March conference call, the STC Summit 2009 strategies were in place. We wanted to show STC members in May how they and others would be able to use this portal to find information on specific topics, careers, programs, research, and practices—all intuitively organized, easily accessible, and in one place. Figure 6 shows a screenshot of the wiki homepage. The goals were to present this wiki appropriately as a stepping stone for exploring issues around creating, populating, and managing the content and to allow people to interact with it as an early draft of the future TCBOK. To create enthusiasm and gather volunteers and ideas, the summit sessions were highly interactive. Session 1 (Carliner, Coppola, Hart, and Reilly, 2009) asked audience groups to role-play three different personas and query the TC Knowledge Portal for appropriate information. Lisa Pappas described this session as it happened in her blog (2009). Session 2 (Davis, Dayton, Hanna, Hart, Kiernan, and Jarrett, 2009) also invited audience groups to test different pages of the TCBOK Portal for content, organization, and usability. Judith L. Glick-Smith, MentorFactor, Inc., praised this session as “pure collaboration, which means everybody wins. No sense of trying to control the meeting. Presenters solicited feedback without judgment or limits” (2009).

At the same time, an interactive display at the STC booth asked members to watch a video introducing the portal to find themselves in the personas, and then to edit wiki pages (Hart, 2009). Attendees posted comments in the technical communication definition and the future of technical communication pages.

Behind the collaborative demonstration of TCBOK progress, pressure within the team was mounting. These tensions flared at a morning TCBOK meeting in Atlanta on Monday, May 4. Task team members, some of whom had been part of the process

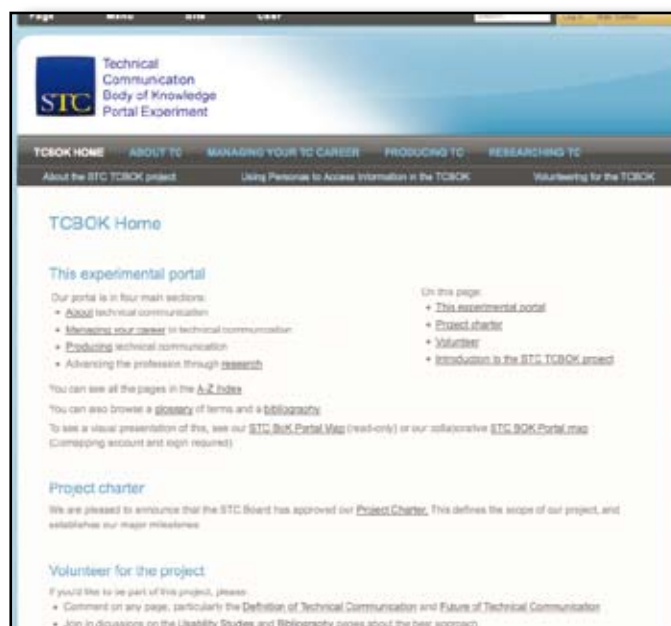


Figure 6. Screenshot of the TCBOK wiki homepage, November 2009

since the A-I Leaders Summit in Houston in 2007, were understandably fatigued but still protective of the portal. Others were concerned about the need for a robust and thorough vetting process for credibility of the TCBOK. And members had differing approaches to populating the wiki with content, with some observing the original hierarchy of the CoMapping site while searching for consensus and others creating entirely new information architecture.

With unresolved questions about intellectual property and ownership, the time had come for setting direction, establishing ground rules, and creating formal governance.

Phase 3: Developing Governance, Strategy, and Change Management, May 2009–September 2009

By the end of May 2009, when the dust settled, Kiernan joined Hanigan as project co-chair, replacing Hart, who had been elected to the STC Board of Directors. Their first response to a maturing task

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force structure was to create a governance committee charged with drafting the project charter. Meeting in twice-a-month phone conferences through the end of August, the governance team (Kiernan, Hanigan, Jarrett, Hart, Joel Kline, Coppola, Hanna, Cheri Mullins, and Dayton) created a document that defined the scope of the project and established major milestones. On August 31, 2009, the STC Board of Directors approved a revised Project Charter for developing and implementing a Technical Communication Body of Knowledge project.

The Project Charter has attempted to define the scope of this huge collaborative project—what it includes and what it does not. There is pressure, for instance, for STC to begin thinking about developing certification courses and programs based on the core competencies being defined in the TCBOOK. But the team has decided that certification is a separate effort that may make use of the body of knowledge, as will many other individuals and groups, but is not within the scope of the task force's efforts. Similarly, the governance team has had to begin grappling with the intellectual property issues that arise from a collection of links, bits of organizational content, definitions, longer original papers, etc. STC will not and cannot own the body of knowledge that exists in the literature and in industry best practices, but access to original content and content controlled by others will probably have to be monetized, if only to recover use fees. The charter attempts to outline the various audiences and goals we envision now and over the next few years.

With the Project Charter in place, the team has begun to develop a strategic plan and a change management process. To date, Larry Kunz, Systems Documentation Inc., is leading the team in creating a strategic plan that focuses on populating the portal with usable content in the first year, then migrating it to a platform with maintenance. The team is also developing a change management process, including editorial, content, and structural change requests, reviews and approvals, as well as dispute resolution. As the first instance of change management, Jarrett compiled an audit of the wiki portal to determine if content published at the STC Summit 2009 has been revised without team review. This phase in the project, which is ongoing at the time of this writing, is also a

period of looking inward and critical self-reflection.

Can we continue a democratic volunteer process while resisting hegemonic takeovers? Will we be able to forgo commercialization until content is properly vetted?

What We Have Learned

As well as producing key project deliverables, we have learned a lot about the realities of such a large volunteer project. Jarrett provided these managerial examples:

- The project responds well to clearly defined goals and deadlines.
- There is a great deal of enthusiasm for this project both within STC and among our professional and academic colleagues in related fields.
- We need time and input from the leaders in our field: busy people. If they throw themselves into our project, as so many involved in the project have done, then they achieve a tremendous amount. We have also seen a degree of burnout as previously active project members have had to withdraw as other commitments intervene.
- We work best with a relatively small team at the center that in turn divides up specific tasks and takes them away to even smaller teams (one to three people).
- We have varying levels of familiarity with technologies. Any of us might be an expert with several while being a beginner at others. Broadly, we are eager to learn new ones, but we may need time and coaching to do so.

After two years of proselytizing the knowledge project by members of the various task teams who were—and are—buoyed by the challenge of being bleeding-edge adopters of a landmark innovation, it is time to pause and take stock. We have made concrete that which existed only as abstract calls to action and mutable scenarios. Yet we recognize the prevailing dynamic and organic structure of any body of knowledge. With a sense of community, we moved individual tacit knowledge to explicit collective intelligence. And we realized the potential for a productive partnership between practitioners and

academics, a potential that Menno de Jong (2009) has envisioned as “a system of dialog and co-production in which practitioners and academics interact with each other about pressing issues on the research agenda and in which practitioners and academics collaborate to contribute to the body of knowledge.”

This project laid the groundwork for a body of knowledge that has the potential to establish technical communication as a true profession. But there is much more to be done. Blakeslee and Spilka (2004) decry the paucity of scholars working on complementary research questions leading to a coherent body of knowledge. They note that “too much research in our field is driven by individual interests and inclination rather than by some overarching initiative” (pp. 76–77). Could not the body of knowledge project provide such an overarching initiative for researchers? Gerald Savage (2003) reminds us that the process of professionalization inevitably involves ideological, political, and economic struggles. “Professionalization is bound to have its undesirable costs for practitioners who lack formal training, for university programs and academics that fail to recognize the real needs of professional education and research, and for professional organizations that do not develop critical awareness of how professionalization actually occurs and accept the necessity of effective political work toward that end” (p. 162). Yet these are struggles we must undertake if we are to benefit from recognition as a profession.

This has been the backstory of a landmark project in our field, one that was built by volunteers who have devoted hundreds of hours of sweat equity and goodwill. It is also the story of a professional organization that had the vision for and commitment to this initiative while supporting it with substantial resources. Each of you will contribute to moving our profession forward; the TCBOOK story of the future will be written by you.

How to volunteer, from Mark Clifford: “Go to the volunteering page on the wiki (<http://stcbok.editme.com/Volunteering>) and follow the easy instructions there, or email me, Mark Clifford (mark@cliffordsells.com), with your contact details. I’d like to know what section(s) of the TCBOOK you’re interested in contributing to. We can then set up a contributors account for you.”

Acknowledgments

All the TCBOOK Task Force members are coauthors of this article. But I want to acknowledge the special efforts and insightful comments of Marjorie Davis, David Dayton, and Hillary Hart, and my colleague Norbert Elliot.

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Requirements Specifications and Anticipating User Needs:

Methods and Warnings on Writing Development Narratives for New Software

Brian D. Ballentine

Abstract

Purpose: This article studies and determines the benefits for technical communicators using narrative to compose and edit software requirements specifications. Specifically, this article is an examination of requirements specifications written for a Web-based radiology application serving the medical industry.

Method: The study adheres to the usability principle that successful design accommodates complex problem solving. Requirements specifications, the application, and the application's code are examined as part of the study.

Results: The first determination is that composing detailed narratives within the requirements specifications can ensure flexible spaces for users, in this case doctors, to view, study, and manipulate data as they see fit. The article also acknowledges and accounts for the reality of low-level or code-level procedural programming required for creating such flexible spaces. The second determination is that employing narratological structures within requirements specifications also leads to technical inventions at the code level. Practitioners will have a better understanding of how their work facilitates the development of a software application's functionality, design, and even code.

Conclusion: Ultimately, narrative is the suggested method for developing the flexible affordances desired by usability specialists and it simultaneously helps negotiate low-level code.

Keywords: Requirements specifications; Usability, Narrative; Interface design; Software development

Practitioner's Takeaway

- Practitioners will gain insight to how technical communication that employs narratological structures facilitates technical inventions at the interface and code levels of software development.
- Readers can examine excerpts from requirements specifications that use narrative in order to witness how technical communication facilitates the development of a software application's functionality, design, and code.
- Technical communicators will learn the importance of striking a balance between development at the code level and developing an application interface that accommodates complex problem solving.
- Technical communicators will be able to identify how narratives included within requirements specifications facilitate knowledge transfer among a development team.

What really happens in most programming shops is that there is no one on staff who has a clue about designing for end users. However, these same clueless people are far from clueless about program design, and they have strong opinions about what they like, personally. So they do what they do, designing the interaction for themselves, subject to what is easiest and most enjoyable to code, and imagine that they are actually designing for users.

—Alan Cooper, *The Inmates Are Running the Asylum* (p. 22)

The inherent solipsism in software engineering described above by Alan Cooper remains a perennial risk. And, when personal preference trumps useful information design, both companies and clients suffer. According to Michael Albers (2003), information design “must be considered the practice of enabling a reader to obtain knowledge” (p. 7). He goes on to declare, “Unless that information is properly designed, displayed, and can be manipulated for interpretation, the information (and consequently, the system) are a failure, period” (p. 8). Albers describes essentially the *usefulness* of a design, and successful design is, of course, informed by usability research and the work of scholars like Albers, Mirel, Spinuzzi, and Quesenbery. Mirel (2003), for example, advances a concept of “usefulness” by insisting that knowledge, or a user’s pursuit of it, is often enmeshed in a series of user-determined, intricate tasks and that we must therefore design to facilitate “complex problem solving” (p. xviii). She advocates for approaching design with what she calls a “structural framework” where there is an “emphasis on the structure of the situated work and how it sets and constrains possibilities for action” (2002, p. 178). Users must have at their disposal flexible options for problem solving.

Mirel (2002) sets her structural framework in contrast to a “procedural framework” that “includes features and user interface interactions for moving from one program state or mode to another and knowing its allowable interactions” (p. 175). The real challenge is that at some point in the development process, procedural and action-driven events must be incorporated intelligently into the design. Mirel (2002) writes:

Admittedly, a low-level, unit orientation is needed once product development moves to the stages of detailed specifications and programming. Object-oriented programming does require attributing elemental properties and events to low-level objects, be they things or acts. Yet the constraints of object-oriented programming and design do not force usability specialists or designers down a slippery slope of designing for discrete low-level actions and operations (p. 173).

Mirel’s assessment of object-oriented programming and design is sound, as is what amounts to her summary advice to “analyze tasks and design at a higher than unit-task level, focusing on the integrated sets of relations and actions” (2002, p. 183). But, the question then becomes what methods and strategies might we employ that will result in the affordances described by Mirel while simultaneously managing the very real and necessary low-level or code-level actions? In other words, if usability specialists or designers want to proceed with Mirel’s structural framework, they will still need a method of negotiating at the code level.

In this study, I investigate how technical communication prowess, specifically the ability to narrativize work flow by documenting an application’s use scenarios, can both negotiate development at the code level and satisfy Mirel’s requirement to accommodate complex problem solving by increasing usefulness, effectiveness, efficiency, and learnability. These four attributes are key components to producing a “truly usable” application or, as defined by Jeffrey Rubin and Dana Chisnell (2008), an application with which “the user can do what he or she wants to do the way he or she expects to be able to do it, without hindrance, hesitation, or questions” (p. 4). Second, practitioners will have the opportunity to witness how technical communication that employs narratological structures *also leads to technical inventions at the code level*. That is, practitioners will have a better understanding of how their work facilitates the development of a software application’s functionality, design, and even code. Evidence is presented in the form of both technical communication and code; each is required to validate this claim. With the use of a large,

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central document from the development of the last commercial software application on which I was a senior engineer, I demonstrate that the contents of software requirements specifications become embedded in the code of the final product. The written communication and its narratives, therefore, serve a valuable epistemic function as the application moves through its iterative design process toward completion.

The application in question, IntelliView Web (IVW), was developed for the medical industry during my employment with Marconi Medical Systems (now Philips Medical Systems). While I am not claiming that all software engineering projects develop as the software project described below, I do wish to demonstrate the critical roles of technical communication and narrative, specifically within software engineering, from a perspective not yet explored. Certainly scholars such as Susan Regli (1999) have made compelling cases for appreciating the contributions technical writers make to the invention process. Regardless of who is doing that writing, however, I want to emphasize the inventive role technical communication plays and offer unique evidence that a “writer” holding any number of job titles plays a crucial part in engineering development well beyond that of mere “scribe” (Regli, 1999, p. 31).

Indeed, the relationship between writing and engineering continues as a rich area of study (Baker, 1994; Geisler & Lewis, 2007; Selzer, 1983; Winsor, 1990, 2003). The narratives written by our team were created, shared, and edited within the software requirements specifications (SRS) for IVW. Through the SRS, we are able to witness both the pitfalls of solipsistic engineering as well as the successful features fueled by way of absent or present narratives. My procedure is as follows:

- (1) Elaborate briefly on how this study defines narrative and what constitutes a successful narrative.
- (2) Describe the generic conventions of an SRS.
- (3) Provide context for the application IVW and a brief history of the medical industry’s transition to the digital age.
- (4) Analyze the development of two specific features in IVW in order to demonstrate narrative’s ability during the development process both to provide the flexibility required for complex problem solving and to manage development at the code level.
- (5) Suggest that we continue to study narrative by carefully investigating how entrenched it is within software functionality.

Defining Narrative

This article does not set out to enter the fray of competing definitions of what constitutes a narrative (Abbott, 2002; Bal, 1997; Fludernik, 2009; Mitchell, 1980; Prince, 1982). As S. Louisa Wei and Huaxin Wei (2006) discovered in their experiments teaching narrative forms to students studying digital arts, theories on narrative are often “loaded with wordplays, divisions, subdivisions, and lengthy explanations of synonyms with subtle nuances, which do not say much to the artist/designer” (p. 481). Instead, this article proceeds by subscribing to a broad and more malleable outlook on narrative offered by H. Porter Abbott (2002) that emphasizes actions or events. According to Abbott:

Simply put, narrative is the representation of an event or a series of events ... “My dog has fleas” is a description of my dog, but it is not a narrative because nothing happens. “My dog was bitten by a flea” is a narrative. It tells of an event. The event is a very small one—the bite of a flea—but that is enough to make it a narrative (p. 12).

Including even the bite of a flea as constitutive of narrative reveals in the coming analysis of the software requirements the smallest uses of narrative in the authors’ attempts to accommodate user needs as well as provide space for flexible problem solving. For example, “The user rotates an image” is a small narrative that signals the beginning of an event-driven scenario within the software application whose outcome will depend on a variety of existing conditions within the application. Mirel’s structured framework approach requires that our narrative respects that “Courses of action are dynamic and emergent, exploratory and opportunistic” (2002, p. 173). So, a successful narrative developed to capture image rotation specifications might note that the user should be able to rotate the image a full 360 degrees by using the mouse or by entering numeric values between 0 and 360 into text fields. The narrative may also specify the types of file formats the application can manipulate as well as the many options users have at their disposal once the image rotation is complete. Meeting Mirel’s conditions will not mean that the narrative captures *exactly* what

users will do next but instead is concerned with being able to accommodate whatever their next decision may be. With that, the narrative might note that other image manipulation tools should be available to the user after or even during the rotation. The ability to zoom in on the image, for example, might be necessary for the user's problem solving. In short, the narrative should be used to ensure that the user will retain options as "[p]roblem spaces are not well bounded" (Mirel, 2002, p. 173).

However, creating an open-ended venue for users to explore options to their problem cannot happen without accounting for the low-level events that make, for example, image rotation possible. At the code level, the *value* of narrative is that it enables the developers to identify and share information on how to address all the possible outcomes stemming from the user rotating. The ability to capture events with technical communication *does* put some "boundaries on human [user] experience so that it is segmented into temporarily meaningful chunks of information, grounding and giving particular shape to knowledge that may otherwise exist in multiply understood ways" (Kim, 2005, p. 123). As Hayden White (1980) remarks, "Far from being a problem, then, narrative might well be considered a solution to a problem of general human concern, namely, the problem of how to translate *knowing* into *telling* ..." (p. 1). Low-level code must still be written and narrative can strike a balance between that coding and accommodating complex problem solving. Ultimately, the narratives our engineering team compose and include in the requirements specifications not only facilitate knowledge transfer that helps maintain a user focus and avoid solipsistic practices, but also generate code.

Software Requirements Specifications (SRS)

The purpose of the SRS is to state in as precise language as possible the functions, features, and capabilities a software application must provide, as well as detail any required constraints by which the system must abide. The document is traditionally drafted collaboratively by a team of engineers, all of whom will work closely with the application's development.

According to the "IEEE Recommended Practice for Software Requirements Specifications" (IEEE, 1998, p. 3), the SRS must address these basic issues:

- a) *Functionality*. What is the software supposed to do?
- b) *External interfaces*. How does the software interact with people, the system's hardware, other hardware, and other software?
- c) *Performance*. What is the speed, availability, response time, recovery time of various software functions, etc.?
- d) *Attributes*. What are the portability, correctness, maintainability, security, etc., considerations?
- e) *Design constraints imposed on an implementation*. Are there any required standards in effect, implementation language, policies for database integrity, resource limits, operating environment(s), etc.?

The SRS is also a company's written and documented understanding of a customer's or potential client's requirements and dependencies *at a particular point in time* prior to any actual coding. The "point in time" remark is important because as the introduction to our SRS in support of IVW (Marconi Medical Systems, 2001) explicitly states, the specifications *will change* as the project develops:

This version of the document captures the requirements for the system to be developed. It is expected that changes will be made during the course of product development. These changes, as well as final screen captures will be included in this document as necessary. Additionally there may be reviews of the document, after the preliminary version is complete, that produce specific action items or decisions about feature sets (p. 1).

It is understood, then, that we would continue to modify and edit the supporting narratives for the application over time. In order for IVW to begin development—that is, for our team to begin writing code and designing interfaces—the SRS needed to contain a cohesive narrative demonstrating the feasibility of the application. It serves as proof that there is a developmental blueprint or road map for the project.

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Introducing IVW and Picture Archiving and Communication Systems

Digital technologies and networked environments are allowing hospitals and the health care industry in general to move away from viewing and storing patient scans only as film or in a hard-copy form. Patient scans, usually captured via magnetic resonance imaging (MRI), positron emission tomography (PET), or computed tomography (CT), can now be stored on a central computer server for doctors and radiologists to archive and access remotely. This system, where computers and networks are dedicated to the storage, search, retrieval, distribution, and presentation of images for radiology, is formally known as a “Picture Archiving and Communication System,” or PACS, in the medical industry. Computers or PACS workstations connected to a hospital’s network offer a means of adjusting the patient scans with special software that enables doctors to crop, rotate, zoom, and otherwise manipulate the patient data. Hospitals can also use film scanners to digitize their existing hard-copy film, and store the data in their new PACS. IVW, Marconi Medical Systems’ software application, was designed to be a novel, remote radiology or “teleradiology” application to expand PACS via the Internet. Simply put, teleradiology is the process of sending radiology images through the Internet to a secure location. With a teleradiology application such as IVW, images can be retrieved anywhere inside or outside the hospital as long as the doctor has access to the Internet and a Web browser.

Imagine, for instance, that someone is injured in a car accident late at night. After the ambulance brings the patient to the hospital, a series of scans needs to be performed quickly in order for physicians to provide effective treatment. Their first concerns: Is there internal bleeding or other damage? Where is it? Are the injuries life threatening? The scans are performed and saved right to the hospital’s PACS server. The hospital pages the radiologist on call, but he or she is at home. With teleradiology, the solution is a simple one. The on-call radiologist turns on a personal computer and launches an application such as IVW. After securely logging in to the system, all the doctor has to do is go to his or her in

box where the scans have been saved and double-click the appropriate icons to view them. No film needs to be generated or archived. After the doctor completes the diagnosis, a brief report needs to be filed. The software allows the doctor to compose the report in the same window as the patient scans, attach the report when it is complete, and then save and send the information back to the central server for physicians to consult.

The Medical Industry Transitions into the Digital Information Age

Beginning in the late 1990s, the medical industry was adjusting to and adopting breakthroughs in information technology. Teleradiology was among such innovations. Adapting to networked and digital environments was and continues to be a challenge to any hospital wishing to implement a PACS. Part of the struggle is that the functionality offered by PACS is in competition with, or more accurately, endeavors to remediate traditional radiology (Bolter, 2001). The migration from film to filmless radiology made possible by PACS has not been a smooth, seamless transition. Radiologists, the end users of PACS software like IVW, with years of experience reading and reporting on traditional film, may be reluctant to accept and transition to PACS. Consequently, there is also tension built into the development process of a new software application such as IVW in that the existing practices, one could even say the existing narratives, governing radiology as a whole resist change. To clarify, IVW’s novel abilities can only depart so far so fast from the old ways of hanging film on a light board. The software and its functionality must successfully negotiate a place for itself within a radiologist’s day-to-day activities. The difficulty for a company such as Marconi is that the application needs to tout its distinctive, even breakthrough, features, which will save time and money along with improving patient care. Conversely, the application and its functionality cannot have departed so far from the established film technology to make its functionality and therefore its existing narrative unrecognizable. In the next section, I will begin to show how the SRS is an integral part of developing an application that successfully manages radiology’s remediation by examining a specific feature

from IVW. I will demonstrate not only how IVW is shaped by the document's narratives but also how the SRS serves as a way of communicating or telling knowledge, aiding the software engineering team as the code develops. Practitioners involved at a similar stage of development should note that here hanging film on a light board is an integral part of a doctor's complex problem-solving process when preparing patient treatment plans. The narratives for IVW needed to respect and if possible preserve that problem-solving space while still providing guidance at the code level. This section relies on a substantive engagement with engineering that requires examining the code that makes IVW possible. By doing so, we will be able to witness how the narratives of the SRS are realized in a final, material product.

From Communication to Cutting-Edge Feature: IVW and "Images-Only"

As we struggled to avoid solipsistic engineering practices and create narratives within the SRS that, as White (1980) suggests, translated our knowledge into a tell-able tale, we needed to keep in mind the older technology: film. Again, film on a light board, not a digitized patient scan displayed on a monitor, has been playing an important role in a doctor's complex problem-solving process. This section examines the functionality in IVW titled "images-only" that attempts deliberately to simulate the experience a radiologist has while reviewing film on a light board. One of the most frequent complaints radiologists have with Web-based applications is that the user interface is bulky and monopolizes too much screen space or "real estate" (Hart, 2003). When radiologists are reviewing film on a light board, nothing obstructs the patient data; we replicated that experience and this problem-solving space by devising the images-only function for the application. This function, which is controlled by the images-only icon at the top of the application, automatically minimizes the

"tree" and the image manipulation area or "toolbox" to their smallest size by revealing only their tabs. In Figure 1, all the standard controls for IVW are visible. Once the user single-clicks on the images-only icon, the patient scan dominates the screen, as seen in Figure 2.

The original entry in the SRS (Marconi Medical Systems, 2001) regarding the images-only functionality is relatively brief. It reads:

Images Only—A button whose purpose is to maximize the image viewing area in the application. This should reduce the tree and image manipulation tools to their smallest (e.g. tabs only visible) so the images can consume a vast majority of the browser window (p. 88).

The language in this description is bordering on noncommittal. The engineers used the word *should* because there is the possibility that this proposed solution may not be the final solution. During usability testing, radiologists, for example, may find images-only deficient in some unforeseen way. Initially, however, this idea was enough to persuade our engineering team that the problem of available real estate had been solved or remediated because radiologists could quickly and easily favor patient data. The images-only icon was essentially a toggle switch for hiding or revealing the tree and the toolbox areas.



Figure 1. IntelliView Web with Tree and Toolbox Showing

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Figure 2. IntelliView Web with “Images-Only” Selected

The impetus to revisit functionality comes from many sources, and it was not long before there was new debate about the possibility of the toggle-switch functionality’s being too simple for the goals of images-only. As IVW developed, management at Marconi allowed us to demonstrate the application at large trade shows in order to obtain user feedback. In addition, radiologists at local hospitals were invited to “test-drive” emerging technologies such as IVW at Marconi Medical’s headquarters. Finally, we were permitted to conduct site visits to hospitals where we observed radiologists at work. The feedback from usability testing is not only invaluable to our engineering team but also often generates edits to existing narratives and a reevaluation of decisions written down in the SRS. Ultimately, images-only needed more advanced capabilities to persuade radiologists of its usefulness.

After a group of doctors visited Marconi to test IVW, they praised the core idea of maximizing the viewing area, but images-only left this important audience wanting more. Specifically, radiologists wanted more advanced control over the tree and toolbox areas of IVW. Radiologists need access to the tree and toolbox area in order to perform basic operations such as opening additional images, manipulating images, creating reports, and saving files. We had not considered what other controls could and should be given to the radiologists when it came to adjusting the available

real estate on screen. In effect, we had inadvertently restricted their problem-solving space. What if, for example, the radiologists just wanted to move the image toolbox area out of the way or just hide the tree? Should the tree and the toolbox have functionality so these areas can be controlled independently of one another? The radiologists suggested that there will be situations where a doctor wants to do administrative work, such as organizing patient files and scans, and he or she may want to see *more* of the tree and not less. Our team did not want the radiologists to view the tree, image toolbox, or images-only as cumbersome or even necessary evils but rather as features or assets.

Consequently, we were forced to revisit the SRS and discuss about how best to

accommodate the needs of the audience.

After taking into account all these advanced needs for screen real estate, we rewrote the narrative describing the possible uses of and the criteria for images-only. The rewritten functionality goes well beyond the original toggle switch of just hiding the tree and image toolbox area. But, since the original, basic toggle-switch functionality received positive reviews, that functionality remained. If the user clicks the images-only icon, the tree and the image toolbox are hidden with only their respective tabs exposed. If the user clicks the images-only icon again, the tree and the image toolbox area return to their prior positions. In addition, based on the usability tests, our team decided that the user should be able to control the size of the tree independently of the rest of the application. By placing the cursor on the vertical bar that divides the tree and the image viewing area, the user may manually resize the tree by clicking and holding down the left mouse button and then dragging the tree frame in either direction. If a user wishes, he or she may drag the tree all the way to the right-hand side of the screen so it completely dominates the real estate on the page. However, in the event that the user does manually resize the tree and then clicks the images-only icon, IVW must be “smart” enough to remember the tree’s position so the application can restore that position in the event that the images-only icon is clicked again. In addition to the tree,

the image toolbox area can be controlled independently as well but with a few differences. The functionality built into the toolbox, such as the ability to zoom in on or rotate an image, does not benefit from having the ability to take up more real estate on screen. That is, the ability to drag the toolbox area to the top of the screen would not, according to doctor feedback, add any value to IVW's functionality, as the controls occupy a set amount of space. Consequently, the area is a binary, either open for use or closed with just the tabs showing. Users may also close the area independently of the tree. In this scenario, users would not click the images-only icon, but instead double-click on any of the image toolbox's tabs to hide it. The image toolbox area can be restored to its default size by clicking once on any of the tabs.

This additional functionality raised the question of whether or not the same abilities should be available for the tree and its tabs. In an effort to maintain symmetry within IVW, we decided to include tab-clicking functionality for the tree. As the narrative became more complex, the importance of documenting all the functionality of images-only in the SRS became increasingly important to a collaborative engineering environment. The design document served as an external memory device that stored design parameters for our team. Otherwise, solipsistic engineering practices would dominate the development of and functionality for images-only. Indeed, a seemingly simple bit of functionality was all of a sudden significantly more intricate.

SRS Narrative to Final Product: Images-Only at the Code Level

The flexible problem-solving spaces detailed above and called for by Mirel (2003) cannot come to fruition without attention to the role narrative plays at the code level. Within the SRS and subsequently within IVW's code, our engineering team divided the layout of the application into separate parts (system menus, tree, image display, and toolbox) in order for areas such as the tree and the toolbox to be adjusted by the user. That is, we adopted what most user interface designers would call a "Center Stage"

pattern for our design where the image display was the dominant focus (Tidwell, 2006, pp. 103–106). Basic conventions for this design pattern hold that "content should be at least twice as wide as whatever is in its side margins, and twice as tall as its top and bottom margins" (Tidwell, 2006, p. 103). A basic outline of the application can be seen in Figure 3.

In order to implement the Center Stage design, we created IVW as a series of different HTML frames held together by a frameset (for an introduction to framesets, see John Duckett's *Beginning Web Programming With HTML, XHTML, and CSS* [2004]). The code that our team developed works to control these individual frames based on the narrative found in IVW's SRS. However, there are rules to understand as we worked our way through the code. IVW is a Web-based application and in this case it was designed to run in a specific version of Internet Explorer (IE). Web browsers such as IE are governed by a set of standards put forth by the World Wide Web Consortium (W3C) known as the Document Object Model, or DOM. The DOM is designed not to favor a particular platform and allows engineers to use programs and scripts to access dynamically the content and structure of documents. One of the key functions that the DOM was designed to enable is the control and manipulation of user actions or "events" within the browser. These events can be mapped directly onto the narratives detailed in the SRS, controlling everything from the outcome following the images-only

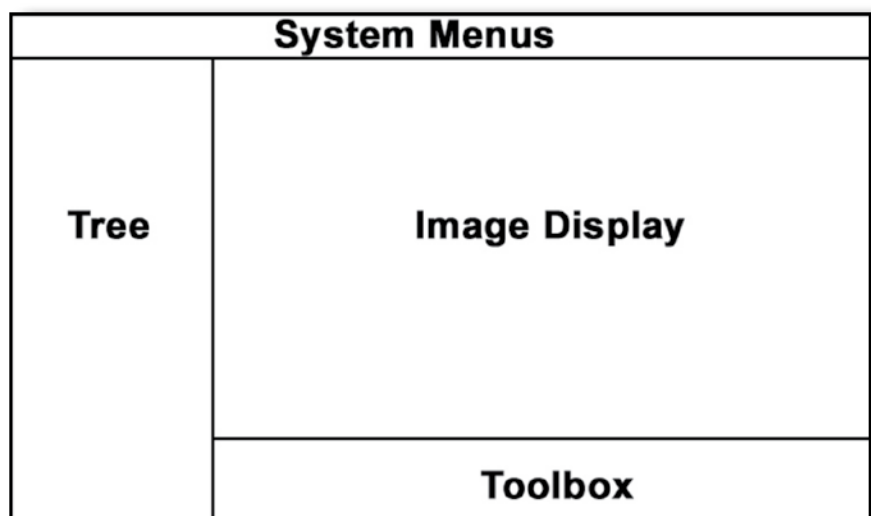


Figure 3. IntelliView Web Frame Layout

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icon's being clicked to what happens when tree tabs are double-clicked. The last version of the SRS supporting images-only that maps out all the possible combinations of user actions, IVW situations, and IVW outcomes for our engineering team to consult and make sense of the increasingly complex nature of the design space is shown in Table 1. Note that the table is read from left to right and is therefore driven by the user action or event occurring within the application.

In order for practitioners to witness how our team used the event-driven narrative found in the SRS to write code, we must examine and understand another technical item about the predominant object-oriented language used to code IVW. In the case of the images-only functionality, the code that controls the frames and consequently IVW's real estate was written in JavaScript. JavaScript can be written right inside the <HEAD> portion of an HTML page, or it can be developed in a separate file and saved with a ".js" extension that is then loaded into the HTML page. The code discussed here was in a separate file titled `frameResize.js`. Inside this file was a series of programmed functions. Each function

contains code responsible for a particular task. For instance, clicking on the images-only icon is an event that triggers a function. The naming conventions for the functions in IVW come right from the SRS. The function names include `treeTabDoubleClick`, `treeTabSingleClick`, `imageToolboxTabDbClick`, `imageToolboxSingleClick`, `imagesOnlyOnClick`, `collapseFrames`, and `expandFrames`. Based on the above table from the SRS detailing the events necessary to manage screen real estate in IVW, the duty of each one of these functions is intuitive because their names describe the functions they perform. When engineers compose design documents such as an SRS, they have the opportunity to name and describe the components that will make up their project. Programmers can name a function anything they desire, but random names would be a disservice to other members on the team who may need to make use of their code and scripts. By deriving the function names directly from the narrative of the SRS, the text is a form of registry. Our engineering team, therefore, reduced the opportunity

Table 1. Updated Images-Only Functionality in IVW SRS

User Action or "Event"	Situation in IVW	Outcome in IVW
Images-only icon is clicked	Both tree and toolbox are showing	Tree and toolbox are hidden; tree position is stored
	Both tree and toolbox are hidden	Tree and toolbox are shown; tree returned to last position
	Tree is showing and the toolbox is hidden	Tree is hidden; tree position is stored
	Toolbox is showing and the tree is hidden	Toolbox is hidden
Tree tab is double-clicked	Tree is showing	Tree is hidden; tree position is stored
	Tree is hidden	Tree is shown; tree returned to last position
Tree tab is single-clicked	Tree is showing	No change
	Tree is hidden	Tree is shown; tree returned to last position
Toolbox tab is double-clicked	Toolbox is showing	Toolbox is hidden
	Toolbox is hidden	Toolbox is shown
Toolbox tab is single-clicked	Toolbox is showing	No change
	Toolbox is hidden	Toolbox is shown

for a communication breakdown and produced more intuitive code. This is just one example of the SRS capturing design specifications, holding those specifications in a collective, long-term memory, and finally serving as a way of telling or sharing knowledge.

All the functions named above rely on information from three of many “global variables” within the application. Global variables are set up by programmers so the data they store can be easily accessed from anywhere in the application. These variables generally contain data that will be needed by other programmers; otherwise, the engineer would simply create a “local variable” that was specific to a particular function. The first two global variables are `gTreeFrameExp` and `gImageToolboxFrameExp`. Our team used a lowercase “g” in front of the variable to identify it as global and, again, the naming convention for the variable is intuitive to the other members of the programming team. So, whether or not the tree frame or the toolbox frame is expanded can be determined from the global variable `gTreeFrameExp` and `gImageToolboxFrameExp`, respectively. Both these variables are Boolean and are set to either “true” or “false.” By default, when IVW first loads, both the tree and the toolbox are showing or expanded, so both of these variables are set to “true.” The third variable is `gTreeWidth`, which stores or “remembers” the position of the tree in order for it to be returned to that exact position if the tree is collapsed and then expanded. If a user clicks on the images-only icon, that event triggers the function `imagesOnlyOnClick`. In following with the scenarios mapped out in Table 1 above, the first step in this narrative is for the function to check to determine whether either the tree or the toolbox is open or expanded by examining the two global variables. The entire function is simply:

```
function imagesOnClick(){
  if (top.gTreeFrameExp==true ||
top.gImageToolboxFrameExp==true){
    collapseFrames();}
  else{
    expandFrames();}}
```

The “||” signifies “or” in JavaScript, the “==” signifies “equals.” That is, both are *comparative* operators and not *assignment* operators. Again, according to the SRS, “if” either of those two areas are expanded, then the job of the images-only icon is to collapse the frames so the radiologist can see as much of the screen as possible. Thus, if either global variable generates a “true” response, then a separate function `collapseFrames` is fired. If neither is true, or to use the programming logic “else,” then both areas must be in a collapsed state and need to be restored to their original sizes. The result is that the function `expandFrames` is fired.

Expanding both frames is slightly more complicated than collapsing them. Returning the toolbox area to its original size is, however, a simple task in that as discussed above, its size is always the same when it is open. It is the tree that requires the use of the mentioned third global variable `gTreeWidth`. One of the responsibilities of the function `collapseFrames` is to capture and store the width of the tree before it is collapsed. Using the DOM, the code provides a “pathway” to the width value of the tree and captures it:

```
top.gTreeWidth=top.document.
frames["container"].document.frames.
["fTree"].frameElement.width
```

While the mission of this article is not to provide an advanced understanding of the DOM, it is important to note that the code that follows the assignment operator or “=” symbol is a path to an element in the application. In this case, that element is the frame containing the tree and we titled it “fTree.” Here, the width of the tree is set as the value of or “equal to” the global variable `gTreeWidth` so it can be “remembered” and used in another function. After that value has been captured, the rest of the code in the function executes and collapses the tree, resulting in just the tabs showing. In turn, when the function `expandFrames` is triggered, the value associated with `gTreeWidth` will be needed to reset the position of the tree. This is also accomplished with the use of the DOM and a path that sets this width for the tree.

To demonstrate how narrative can lead to engineering invention, computer code can be mapped

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onto Table 1 from the SRS. The first event in Table 1, excerpted below, deals with possible scenarios if the images-only icon is clicked.

The naming conventions and the procedures found in the code described above can be shown to have been generated by the SRS by replacing the language in the table with the appropriate code (N.B.: In JavaScript “!=” is a comparison operator signifying “not equal.”) See Table 2.

The code generated in order to make the images-only functionality a reality was propagated directly by the SRS. The narratives within the document ensured that this array of additional features could perform with the flexibility required to accommodate a doctor’s often open-ended and complex problem-solving processes. The SRS was ultimately imbricated in the design process and the final material product. That is, as the narratives told in the SRS resurface in functionality of the application, practitioners should have a better understanding of how their work can facilitate development. Engineering students (or anyone who will be responsible for technical communication) should not understand the task of developing such texts

as something to be started once the engineering work is finished. Too often, the engineering project is completed first and the communications follow. The goal has been to demonstrate how beginning the engineering process with narrative-driven requirements specifications can help meet user needs and expectations. Images-only began as a form of technical communication or textual production and it evolved into code. Eventually, everyone from the engineers to end users were pleased with the functionality of images-only and its solution to the problem of screen real estate.

System Menus and the Danger of Incomplete Narratives

In the images-only section, our team made many adjustments to IVW’s SRS and functionality based on user feedback and usability testing. The end result was that images-only became a distinguishing and successful feature in IVW. However, the first time a working prototype of IVW was demonstrated publicly at the annual Radiological Society of North America

Table 1 Excerpt

User Action or “Event”	Situation in IVW	Outcome in IVW
Images-only icon is clicked	Both tree and toolbox are showing	Tree and toolbox are hidden; tree position is stored
	Both tree and toolbox are hidden	Tree and toolbox are shown; tree returned to last position
	Tree is showing and toolbox is hidden	Tree is hidden; tree position is stored
	Toolbox is showing and tree is hidden	Toolbox is hidden

Table 2. Updated Images-Only Functionality with Code in Place of the Original Text

User Action or “Event”	Situation in IVW	Outcome in IVW
onMouseClick= imagesOnlyClick	top.gTreeFrameExp==true top.gImageToolboxFrameExp==true	collapseFrames() gTreeWidth=n
	top.gTreeFrameExp!=true top.gImageToolboxFrameExp!=true	expandFrames() gTreeWidth=n
onMouseClick= imagesOnlyClick	top.gTreeFrameExp==true top.gImageToolboxFrameExp!=true	collapseFrames() gTreeWidth=n
	top.gTreeFrameExp!=true top.gImageToolboxFrameExp==true	collapseFrames()

convention, we received unexpectedly negative assessments of some key functionality features in IVW. The “tree,” for example, while appearing to be quite similar in design to a standard Microsoft Windows tree table, did not behave with the same expected Windows-like functionality. As with Windows-based directory structures, IVW’s tree is a mechanism for a doctor to manage his or her patient data, query files, and organize and open scans. Tree tables are typically an effective means to “show the hierarchy of items, plus a matrix of additional data or item attributes, in one unified structure” (Tidwell, 2006, p. 197). However, doctors using the prototype tree attempted to context-click or “right-click” on menu items for additional editing and properties information just as they would in a Windows operating system. That functionality, unfortunately, was built in elsewhere in the application and not intuitive. Right-clicking produced no results in the demonstration version of IVW. Doctors also tried to “drag and drop” files to reorganize the tree. This feature was also not programmed into the application. The feedback from the trade show illustrates the danger of not beginning by writing content for the SRS. In these instances we were not guided by event-driven narratives and instead let our own personal preferences dictate the development. In our rush to develop, we failed to identify, document, and replicate established expectations. Simply put, there were (and still are) *de facto* functionality standards that were governing user expectations that our team had not considered in the SRS. Research from the field of usability studies offers guidelines and even heuristics that can help prevent against similar oversight. In her chapter “The Five Dimensions of Usability,” Whitney Quesenbery (2003) suggests a series of prompts to safeguard against this design flaw, including, “Are users making mistakes because they expect the design to follow a standard?” (p. 101). For an interface to be useful, it must be consistent with standards. “A consistent interface ensures that terminology does not change, that design elements and controls are placed in familiar locations, and that similar functions behave similarly” (Quesenbery, p. 89). If an attempt was made to release IVW with functionality that went against these standards, it became clear that the application would not be persuasive and ultimately not be adopted by the market. Such standards are proliferated by the

functionality found in the dominant operating systems and software on the market, mainly Microsoft products. Our engineering team left the trade show needing to reevaluate and rewrite the SRS to include a then-absent narrative structure.

In addition to some of the functionality in the tree, the tabbed systems menus at the top of the screen performed much differently than users expected. Once again, we had disregarded functionality found in dominant software. This portion of the study examines how the omission of documentation on the expected performance of the menus from the original SRS led to poorly developed functionality and unpersuasive or less useful software. The tabs and the menus associated with them represent some of a doctor’s fundamental controls. Needless to say, offering an inconsistent interface, especially where such fundamental behaviors are concerned, could easily sabotage the ability of these menus and their functionality to play any role in the problem-solving process. From left to right at the top of IVW’s screen, the three tabs are File, User, and Help. When doctors testing the application originally placed the cursor over a menu tab, the menu and its contents automatically appeared or “dropped down,” as in Figure 4.

Behaviorally, this is counterintuitive to the functionality built into applications such as Microsoft Word or Internet Explorer, where a user places the cursor on a tab and that tab’s menu simply changes color, as in Figure 5. In order to see the contents of the menu in Microsoft applications, the user must single-click on the tab, as in Figure 6.

This difference, although slight, was enough to provoke strong, negative comments from users such as “I didn’t expect to see the menu,” “It’s distracting,” and “I didn’t mean to open that.” Again, our team had failed to explicitly describe what happens when a radiologist interacts with the menus and how the menus perform. Instead, we had focused only on the functionality of the contents *inside* each menu. For example, the original SRS Section 3.12.3.6.1 titled “File Menu” addresses only what happens if a user selects E-mail, Print, or Exit from the menu options. The SRS (Marconi Medical Systems, 2001) reads:

- E-mail—Will manually e-mail a link to the currently selected information from the current user to any

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e-mail address. The link will take the e-mail recipient into the application in e-mail mode with the selected information displayed. See Section 3.12.1.1 for more details on e-mail mode. The entry will only be enabled when an object being displayed can be e-mailed (e.g., a study or a result).

- **Print**—Will print the currently selected objects using RAP/WAP. This menu option will only be enabled if a printable object is being displayed (e.g., a study or a result).
- **Exit**—Will close the user's session in the application and will attempt to close the browser window in which the application is running. This exit option performs the same function as the Exit button described in Section 3.12.3.5 (p. 89).

Nowhere in the SRS is there documentation in support of how the actual tabs and menus function. The end result was solipsistic engineering and a strongly disliked portion of the application generating negative user feedback.

The software engineers charged with fixing the functionality of the tabs and menus in IVW needed to return to the SRS and write a narrative for the menu behaviors. In the images-only example above, the engineers used the SRS and existing film technology to advance and build the rest of the events for managing the Center Stage design pattern and a space to accommodate complex problem solving. In this example, the engineers determined the established or expected series of events for tabs and menus found in

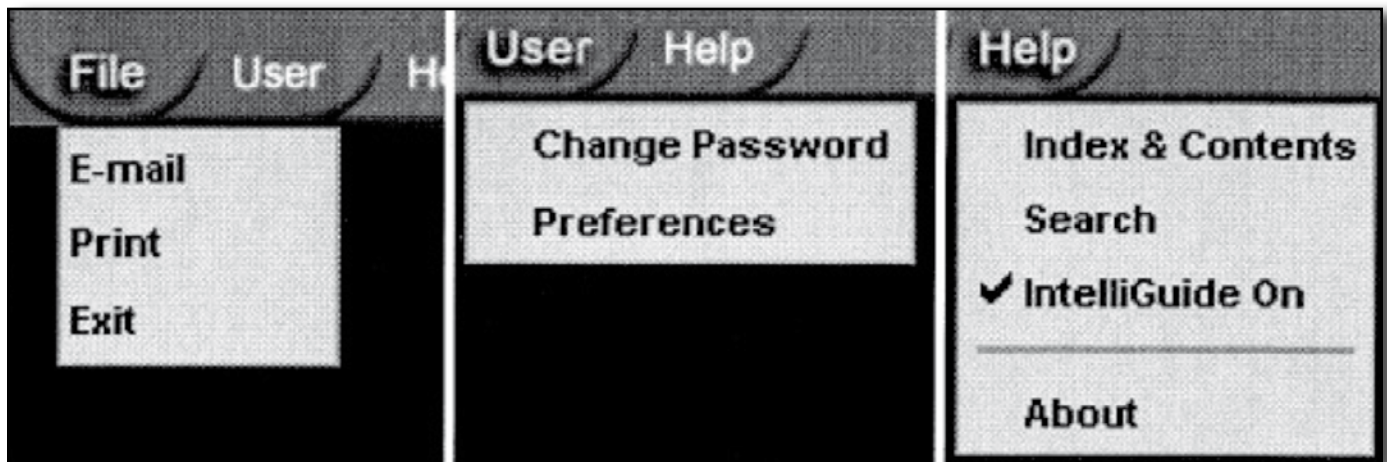


Figure 4. IVW's Tabs with Menus Showing



Figure 5. Screen Capture from Microsoft Word

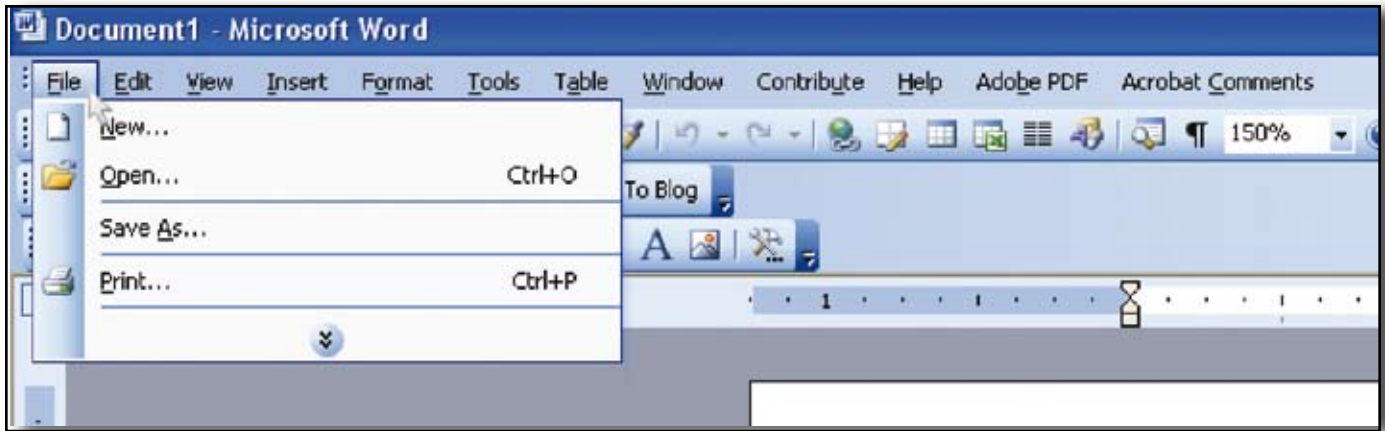


Figure 6. Screen Capture from Microsoft Word Where a Menu Appears After a Tab Is Clicked

dominant software applications when they returned to edit the SRS. The SRS now had language that dictated if a user places the cursor on top of any of the tabs, the tabs will now only change color. As soon as the mouse is removed from the tab, the tab changes back to its original color. If a user places the cursor on a tab and clicks the left mouse button, then the menu associated with that tab will now appear below it. The menu will remain open until the user completes one of three actions. First, he or she can click with the mouse anywhere else on the application screen and the menu will disappear. Second, selecting any of the active options from the menu—for example, clicking on Print under the File tab—will execute the print function and close the menu. Finally, just as with standard Windows applications, if a user moves the cursor over a different tab, the menu originally opened will disappear and the new menu from the appropriate tab will appear automatically. As with the images-only functionality, the engineers added to the SRS by mapping out this functionality as a series of event-driven actions in a table (see Table 3).

The functionality, at first glance, appears straightforward. However, the menu items' appearance and functionality require more complex coding. The menus in IVW rely heavily on DHTML, JavaScript, and the DOM. Our team leveraged the DOM and its ability to accommodate user events in a Web-based application. Microsoft's Developer Network (2009) contains explanations and sample code for "event handling" with the DOM. It explains,

Clicking a button, moving the mouse pointer over part of the Web page, selecting some text on the page—these actions all fire events, and a DHTML author can write code to run in response to the event. This particular piece of code is generally known as an event handler, because that's what it does, it handles events.

While coding event handling appears as a straightforward concept, the power to create events becomes at best unwieldy and at worst detrimental to a project without a guiding narrative. The updated SRS, which now documented the events, situations, and outcomes for the three menus, directed the development of the code for the menus. There are numerous established and standardized events that a browser like IE can recognize, such as `onMouseOver`, `onMouseOut`, `onClick`, `onDblClick`, and `onKeyPress`. The menus in IVW make use of three event handlers, `onMouseOver`, `onMouseOut`, and `onClick`. In practice, when a radiologist moves the mouse over a menu tab, the `onMouseOver` event is used to fire a function that handles this event with the line of code: `onMouseOver="menuChangeOver ();"`. Simply put, the engineers have created a separate JavaScript function called `menuChangeOver` that is here activated by the user event. In this case, the event is the user "mousing-over" a menu tab. As with images-

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Table 3. Updated Tabs and Menu Functionality in IVW SRS

User Action or “Event”	Situation in IVW	Outcome in IVW
User puts cursor on tab	No other menus are open	Menu tab changes color
	One menu is already open	Menu tab changes color; new menu displays; old menu closes
User puts cursor on tab and clicks	No other menus are open	Menu tab changes color; new menu displays
User removes cursor from tab	No menus are open	Menu tab changes back to default color
	A menu is open	Menu remains open
User removes cursor from tab and clicks	No menus are open	Menu tab changes back to default color; menu closes
	A menu is open	Menu tab changes back to default color; menu closes
User clicks on a menu item	A menu is open	Appropriate function fires; menu closes

only, this is another instance where narrative guided us as we endeavored to manage all the different scenarios for the menus and develop the code. Without the SRS as a way of knowing how the menus should perform, the team was left, as Cooper (1999) fears, “designing the interaction for themselves” with no focus on end users or audience.

When the function `menuChangeOver` is triggered by the `onMouseOver` event, the series of events mapped out in the new SRS states that if another menu is already open on the screen, then the next menu tab should automatically open when the mouse moves over it. Without dissecting all the complexities of the DOM, two lines of code verify whether or not another menu is currently open, and, if so, the function responsible for displaying or “dropping” the next menu is fired. The code is:

```
if (top.frames["container"].
frames["fSystem"].mMenu.isOpen==true) {
  dropFileMenu (w,x,y,z,pMenu); }
```

For instance, if `mMenu.isOpen` is found to be “true,” then the `dropFileMenu` function fires. However, regardless of whether or not another menu is open, (if `mMenu.isOpen==true`) the narrative for the menu events in the SRS tells the engineers that the

function still must change the color of the menu tab. Our team, therefore, included code in the last line of the `menuChangeOver` function that executes the color change. This function is titled `changeOver`, and its sole purpose is to change the color of the tab to its highlighted state.

The `onMouseOut` and `onClick` events are also essential in engineering and preserving the scenarios documented in the SRS. The code attached to the `onMouseOut` event—that is, when a user removes the cursor from a tab—serves to fire a function called `changeOut`. The sole purpose of this function is to change the color of the tab back to its original state. Finally, the `onClick` event is responsible for displaying the menu for a tab if the user does click. Once the user has the cursor on the tab, then the `onMouseOver` event has already been triggered and the tab has changed color. If the user then clicks the tab, the `onClick` event fires the function `dropFileMenu`, which is responsible for displaying each tab’s menu and its appropriate content. All three of these event handlers, `onClick`, `onMouseOver`, and `onMouseOut`, are used to maintain the expected series of events contained in the SRS dictating how menus display and how users interact with them in IVW.

If these processes seem challenging, it is because they are. What I wish to make clear is that without taking time to compose a narrative, our engineering team overlooked a standard tenet of usability studies requiring design to adhere to established conventions. A doctor's problem-solving process cannot be impeded by the design of the very tool he or she is using to problem solve or, in this case, treat patients. However, using the first three rows from the revised SRS in Table 2 above, we can see how our failures were addressed by once again mapping the code directly onto the language from the SRS. My claim is that it is the SRS that enabled our team to repair their solipsistic engineering and successfully develop IVW's system menus after the first failed attempt.

The naming conventions and the events found in the code described above can be shown to have been generated by the SRS by replacing the language in the table with the appropriate code. Table 4 below demonstrates how the computer code mirrors the

language in the SRS. Event-driven narrative structures within the SRS capture each adjustment engineers make to the application as they can more accurately simulate, describe, or tell the story of IVW's use as design proceeds.

Just as with the images-only functionality, the code engineered for the tabs and menus appears here as a direct result of the language in the SRS. The tabs and menus, as with images-only, were treated not as fixed and final but as functionality that could be returned to and rewritten via the SRS. This is a critical point, as the SRS in this example focused us on designing for others and not remaining entrenched in our own comfortable preferences. Our team had never asked, "What will or will not make these menus usable?" Instead, we started engineering guided only by our own preferences. The SRS was needed not only to guide the development at the code level but also to keep the needs and expectations of the end user in focus.

Table 3 Excerpt

User Action or "Event"	Situation in IVW	Outcome in IVW
User puts cursor on tab	No other menus are open	Menu tab changes color
	One menu is already open	Menu tab changes color; new menu displays; old menu closes
User puts cursor on tab and clicks	No other menus are open	Menu tab changes color; new menu displays
User removes cursor from tab	No menus are open	Menu tab changes back to default color
	A menu is open	Menu remains open

Table 4. Updated Tabs and Menu Functionality in IVW SRS With Code in Place of the Original Text

User Action or "Event"	Situation in IVW	Outcome in IVW
onMouseOver	mMenu.isOpen!=true	changeOver
	mMenu.isOpen==true	changeOver; menuChangeOver; dropFileMenu
onMouseOver; onClick	mMenu.isOpen!=true	changeOver; dropFileMenu
onMouseOut	mMenu.isOpen!=true	changeOut;
	mMenu.isOpen==true	No change

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Conclusion

At a 2007 conference, John Carroll (2007) advocated “narration” as an “outside-in alternative to specification.” He suggested that using narrative could help designers maintain a focus on a project’s “big picture.” Part of that big picture must be useful information design that offers the “leeway” required for complex problem solving (Mirel, 2002, p. 175). In the first example above, narrative included in the SRS ensured the outcome of a flexible space for doctors to view, study, and manipulate patient scans. Through this example, images-only, practitioners could also see how entrenched writing is within the development process and low levels of code. Conversely, the second example detailing missing narration for menu functionality served as an important demonstration of how an absent narrative may contribute to an application’s failure to meet standard usability conventions. Applications like IVW are useless to end users if their development is guided by only the whims of a cloistered team of engineers and technical writers. Narrative mediates the development of the application, and the users reap the benefits when the narratives resurface in the functionality of the application. I suggest that researchers and practitioners study further how to more efficiently incorporate narrative in the design process and continue to search for means of teaching or at least sharing their methods and strategies for employing narrative.

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About the Author

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Copyright Law as Mediation Means:

Report on a Mixed Methods Study of U.S. Professional Writers

Martine Courant Rife

Abstract

Purpose: This article reports on 12 select findings from a sequential mixed-methods, empirical study of U.S. educational-context professional writers composing for the Web. The study explores the status of knowledge and understanding of U.S. copyright law, levels of chilled speech, and the use of rhetorical invention in such digital writing contexts.

Method: Research methods include a digital survey receiving 334 responses from randomly selected students/teachers and discourse-based interviews with seven of these participants.

Results: With respect to authorship, Web writers sometimes occupy conflicting positions. Empirical evidence challenges traditional ideas of authorship, i.e., a single author working alone in a garret, producing texts from his or her sole creative genius. The study finds digital writers' speech is not as "chilled" as one might expect, and while knowledge of copyright law is important to digital writers, they are fairly confident in the knowledge they have. Copyright law is not the primary concern of digital writers. As it turns out, ethics trumps the law in importance when considering digital composing choices. In the area of copyright knowledge, key misunderstandings appeared among writers. For example: confusion on (1) the difference between copyright and plagiarism, (2) unauthorized use and authorized use, (3) the government exception to copyright, and (4) the fact that U.S. copyright law protects "creative" work to a higher extent than it protects "factual" work.

Conclusion: The study hopes to provide a methodology for further research, and a baseline in the area of knowledge and understanding of copyright law as it intersects with invention, among the professional writing population.

Keywords: Copyright; Invention; Mixed-methods; Chilled speech; Plagiarism

Practitioner's Takeaway

- The overall participant copyright-knowledge score is only 63%; we need professional development to increase digital writers' copyright knowledge
- For designing EULAs (End User License Agreements) or Terms of Use, the mediational-digital composing heuristic offered here contains rhetorical topics motivating users' choices on whether or not to appropriate and/or remix content
- More focus is needed in the field of technical communication on how writers can legally protect their own work
- The practitioner-academic divide is a much less bright line than we might think.

Overview and Project Description

This article reports on a sequential mixed-methods (Creswell, 2003; Greene, 2007), empirical study of U.S. educational-context professional writers and the mediational (Hart-Davidson, 2007; Hutchins, 1995; Spinuzzi, 2003) influence U.S. copyright law might have on their digital writing processes. Research methods include a digital survey among randomly selected students/teachers (N=334) and discourse-based interviews with 7 digital writers. In order to limit the research scope, I chose to focus on U.S. writers because I examine the influence of *U.S. copyright law*. Copyright law varies greatly from country to country, and in many instances due to the global reach of the Web, the entire job of figuring out which country's copyright law applies in the event of a controversy is extremely complicated and difficult (see *Moberg v. 33T LCC*, 2009, for a recent but accessible example of a case where the main issue examined in what country a work originated and which law applies). Because of the extreme complexity involved in international intellectual property issues, along with the fact there is no "international law" but instead multiple international treaties deciding which law applies when and what legal protections are available where, I clarified the scope of my research for participants by informing them responses to copyright knowledge questions in the survey are limited to U.S. law—thus my rationale for containing the population to U.S. writing program participants. Although the research is limited to U.S. law and a U.S. population, many agree U.S. copyright law has a profound influence on international law and policy (Bowrey, 2005; Gellar, 2000; Hennig & Tjarks-Sobhani, 2004; Okediji, 2000; Ricketson, 1986). Therefore, my research might be informative to international audiences and might provide a point of contrast for additional studies in other countries.

Further, the research methods and intellectual property focus might possibly be used in other countries to study local knowledge/influence of countries' respective copyright laws (see Hennig & Tjarks-Sobhani, 2004, for exemplary international empirical research)—and the research could be continued to include examinations of how writers working in global contexts

understand/consider international intellectual property law issues (if at all). For technical writers who design EULAs (End User License Agreements) or Terms of Use for various digital interfaces, the findings from the empirical study might be instructive.

I define *empirical* as "the way of knowing through the senses, through direct, physical experience. As a mode of inquiry, it goes back to Aristotle's concept that we come to know essences by the process of abstraction, inductively moving from particular sense data to a knowledge ..." (Kinney, 1979, p. 352). My study is empirical in the sense it differs from literary interpretation or more abstract theoretical approaches to scholarship. In other words, I write this article based on first-hand, original, and primary data collection with real people and their texts.

Three main areas are examined: (1) the status of knowledge and understanding of copyright law among educational-context professional writers; (2) rhetorical invention (Portewig, 2008; Melton, 2009) processes of these writers as copyright law intervenes in their composing; and (3) levels of chilled speech among digital writers. In this article 12 key findings from the study are discussed as well as implications from those findings. The study hopes to raise a few issues and provide a baseline that might be used for further research.

In fall 2007, after almost 2 years of pilot study work with my collaborator William Hart-Davidson (Rife & Hart-Davidson, 2006), I launched a full-fledged empirical study exploring U.S. copyright law's mediational influence on digital composing using a sequential transformative mixed-methods research design. It was called "sequential" because it uses two phases: the first phase includes a digital survey, and the second phase includes the collection of Web texts and discourse-based (Odell, Goswami, & Herrington, 1983) interviews about those Web texts with 7 writers who also participated in the survey.

Defining Key Terms

Key terms used throughout this article:

1. Chilled Speech: Failing to include content, publish to the Web, or generally suffering anxiety due to fear of copyright liability.

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2. Mediation: A particular mode of organizing behavior that coordinates between the behavior and a mediating structure that is not necessarily part of the inherent task domain (Hutchins, 1997, p. 338; Rife, 2012).
3. Heuristic: An intellectual structure, in this case a “mediating structure,” used to organize rhetorical topics under consideration during the composing process (Haller, 2000; Lauer, 1970; Rife, 2012; Selber 2004).
4. Rhetorical Invention: One of the five canons of invention as conceived by Aristotle, along with style, arrangement, delivery, and memory. Invention is a generative canon, and the method by which we seek what to say—but it is also a way of knowing the world through the accumulation of probable knowledge, knowledge that can be drawn upon in order to generate ideas and decisions (Lauer, 1970, 1979, 2004; Miller, 2000; Young, 1978; Rife, 2012). Inventive strategies help writers make decisions in that realm between “fact” and “mere opinion”—the realm of rhetoric (Booth, 1974).

An Inventional Heuristic

In addition to the 29-question digital survey testing knowledge of copyright law and levels of “chilled speech” in light of copyright law, digital writers participated in discourse-based interviews designed to elicit tacit knowledge regarding how writers factored in copyright law and fair use in composing decisions—i.e., the mediational influence of copyright law in composing decisions. So my theoretical frame for the research includes the idea copyright law as an inventional heuristic (for a discussion of inventional use of heuristics by expert professional writers, see Welle Donker-Kuijer, De Jong, & Lentz, 2008; De Jong & Schellens, 1997, 2000; De Jong & Van der Geest, 2000) is mediating the composing choices of digital writers.

In other words, copyright law is influential in finished texts, but by the time a final textual product emerges, the rhetorical considerations, the heuristic for rhetorical invention deliberated upon is erased (Haller, 2000). The rhetorical arguments informing composing choices that take place before the finished product

emerges are “stripped” out, “lending the text an apparent objectivity that obscure[s] its rhetorical origins” (p. 354). One key method to learn about these “stripped out” inventive processes is to interview authors. Interviewees in my study are 7 individuals who took the survey and are professional writing students or recent graduates working in the field, and range from undergraduate to PhD candidate. All interviewees work as Web writers and/or managers of Web spaces—some have substantial technical writing backgrounds. An examination of a wide variety of Web texts provided by interviewees supports the discourse-based interviews by helping me create interview questions wherein I looked for the influence of copyright law in a finished text.

The Law

Before discussing the study’s findings, I briefly explain U.S. copyright law and its relevance to digital composing and thus offer a rationale for why copyright law is important and why writers’ understanding of it might impact their composing choices. In sum, under U.S. law (Title 17, U.S.C.) anything in “fixed,” “original” format, including Web-published materials, are automatically copyright protected without registration, regardless of a writer’s “legal awareness.” Thus, Web publishing triggers all kinds of complex legal issues (the same is true for countries who participate in international intellectual property treaties such as the Berne Convention—but for purposes of time and space here, I limit my discussion to *U.S. law*). Further, because Web publishing instantaneously delivers content to anyone with access, the use of others’ copyrighted materials in one’s own compositions is potentially highly visible in a way that might not have been true previously. Due to this instant and potentially highly visible dissemination, copyright holders are becoming more aware and assertive about their rights than might have been true in the past—which explains the growing interest in this particular area (specifically, copyright law for digital writers). (See CCCC Caucus on Intellectual Property, 2000; DeVoss & Porter, 2006; Herrington, 1997, 2001, 2003; Juillet, 2004; Lessig, 2004, 2008; Logie, 1998, 2005, 2006; Reyman, 2006; Vaidhyanathan, 2001, 2004; Westbrook, 2006; but for a historical perspective, see also Institute

of Electrical and Electronics Engineers (IEEE), 1977, 1979.) Further, the professional writing community as creators of content should be aware of copyright issues in order to protect their own proprietary creations from unanticipated and/or exploitive appropriations. This is an extremely complicated legal area but I offer a brief overview here.

Four main areas of copyright law often arise when composing for the Web: (1) copyright law's basic protections; (2) exceptions to those protections as provided in the fair use statute, Title 17, Section 107; (3) work-for-hire law as stated within Title 17; (4) issues of authorized or licensed use: use with permission. A prime example is the Creative Commons (see www.creativecommons.org) system of licensure. Creative Commons is a system developed and now international, providing content creators with free boilerplate licensing they can place on their works so others can have clear guidance on later appropriations. For example, I could label this article with a "Creative Commons Attribution-Noncommercial-No Derivative Works 3.0 United States License," which indicates U.S. laws offer primary governance over later situations, and others can use my work freely for noncommercial purposes as long as they attribute me and do not use my work to make derivative works—they should not take my article and turn it into a conference presentation, and so on. You can see how complicated these issues are.

Title 17, Sections 102 and 106, Copyright Protection U.S. copyright law (Copyright Law of the United States, Title 17, U.S.C., 2009), enacted through Congress's constitutionally granted power under Article 1, Section 8, U.S. Constitution, is applicable to Web composing because it provides automatic protection to any work that is fixed and original. Because of copyright law's broad application, virtually all digital publishing, whether or not it incorporates another's text, visuals, sounds, or movies, is going to invoke copyright law. Protected works include notes, Web pages, software, computer code, emails, reports, patterns, tutorials, instructions, manuals, visuals, video, audio, and all other "fixed" media. Under current law, a copyright holder holds exclusive rights to copy, distribute, perform/display, and create derivative works.

Title 17, Section 107, Fair Use

Relief from the copyright holder's exclusive rights is provided in the fair use doctrine as codified in Section 107 of the U.S. Copyright Act (Copyright Law of the United States). Fair use is relevant in the context of unauthorized use (using without permission). Title 17, Section 107, defines fair use as "reproduction in copies ... or by any other means ... [for uses] such as criticism, comment, news reporting, teaching (including multiple copies for classroom use), scholarship, or research" (Copyright Law of the United States). The four factors courts use to make legal determinations regarding infringement are listed in the statute, and function as a legal heuristic guiding not only judges, but also attorneys, users, authors, and others who attempt to make everyday composing decisions.

Those four fair use factors ask that one consider:

1. The purpose and character of the use, including whether such use is of a commercial nature or is for nonprofit educational purposes
2. The nature of the copyrighted work (nonfiction has less protection than "creative" work)
3. The amount and substantiality of the portion used in relation to the copyrighted work as a whole
4. The effect of the use upon the potential market (Title 17, Section 107, U.S.C.)

Title 17, Section 201(b), Work-for-Hire

Just as copyright protections and fair use exceptions try to control or organize how texts are appropriated and circulated, the work-for-hire provisions of Title 17 provide a default author in employer-employee contexts. In employer-employee situations, an employee's creations made within the scope of employment are technically "authored" by the employer, who thus owns all copyrights unless the parties have expressly agreed otherwise in a signed writing. Work-for-hire issues are relevant for professional writing students, who very quickly leave educational settings and become employees at organizations where their own notions of individual authorship, as often emphasized in academia, may be seriously challenged. Further, my research shows among the digital writers interviewed, all had already done some form of paid writing prior to graduation. Some of this paid work was extensive.

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Authorized Use, or License

Sometimes writers do not need to worry about whether or not they are within the perimeters of fair use because they receive express permission from a copyright holder, or they use within the confines of a preattached license. The Creative Commons Web site provides a number of boilerplate copyright licenses writers affix to their work, allowing future authors to appropriate under certain conditions as stated in the license.

Existing Literature and Research

This study extends the work of previous empirical studies conducted regarding U.S. copyright in educational contexts (Dush, 2009; Fisher & McGeveran, 2006; Heins & Beckles, 2005; Hobbs, Jaszi, & Aufderheide, 2007). Dush (2009) examines copyright knowledge students have prior to entering her writing classroom and reminds us students do not arrive as blank slates but have preexisting knowledge and copyright stances. Hobbs, Jaszi, and Aufderheide (2007) examine U.S. teachers/students and find serious misunderstandings among the population that restrict “media literacy” in the form of expression, teaching, and learning. Heins and Beckles (2005) surveyed a broader audience of artists and scholars, finding respondents only have a vague understanding of fair use, and this uncertain knowledge circumscribes composing practices: “There is an urgent need for accurate information” (p. 54). Among the educational community, Fisher and McGeveran (2006) find undue fear about copyright infringement liability constricts exchanges of valuable information across social network spaces. They find DRMs (Digital Rights Management technologies) require even pure educational users to knowingly violate copyright law by circumventing anti-access measures in order to gain access to digital texts. Apparently, such illegal circumvention is a common practice. Together these studies say there is lack of knowledge about copyright, and this misunderstanding is chilling or circumscribing speech. Fisher and McGeveran (2006) as well as in my pilot study (Rife & Hart-Davidson, 2006) find writers are willing to break the law in some circumstances if they think the law is wrong and feel it is ethical to violate law in order to accomplish goals.

Additional research in technical writing explores issues in the area of public policy, public uses of technical communication, as well as intersections between technical communication and the law (see, for example, Durack, 2001, 2004, 2006; Herrington, 2003; Howard, 2004; Juillet, 2004; Logie, 2005, 2006; Reyman, 2006, 2008; Rife, 2006, 2007; Waller, 2006). My study also focuses on connections between rhetorical invention and composing, an area of interest in technical communication (Portewig, 2008; Melton, 2009).

Research Questions

The detailed research questions explored with the survey and interviews are as follows:

1. What do writers know and understand about copyright and fair use?
2. How confident are writers in this knowledge?
3. Are writers unable to express themselves fully because of fear of copyright liability, i.e., is their digital “speech” chilled?
4. How important do writers think knowledge of copyright and fair use is to their work?
5. What is the relationship, if any, between knowledge of copyright/fair use, confidence in that knowledge, and levels of “chilled speech” in digital environments?
6. When writers create Web texts or write for the Web, does their understanding of copyright law and fair use influence the choices they make?
7. How do writers understand copyright law and fair use as they do rhetorical invention in digital writing?
8. How do writers reshape the law as written via their understanding (what happens as the external law becomes internalized)?
9. What other rhetorical topics are at work in writers’ minds as they compose for the Web, other than copyright and fair use?
10. What kinds of things do professional writing students need to know in order to be experts after they graduate or when they are writing outside the educational setting?

Questions 1–5, and to a small degree Question 9, are investigated in the survey. All the questions are explored in the interviews, but in the interviews the main focus of inquiry is on Questions 6–10.

Methodology

A sequential transformative mixed-methods study design explored research questions primarily in two spaces: (1) cyberspace via the online survey; (2) a conference room at a Midwest university where participants attended or had recently attended as students.

Survey

A stratified, random selection of 155 professional and technical writing programs and National Council of Teachers of English (NCTE) writing majors, STC and AT1W membership, and NCTE writing major lists as of September 2, 2007, were surveyed. The lists are maintained by the Conference on College Composition and Communication—NCTE, AT1W, and STC. When creating the final list, programs from countries outside the United States, with no Web presence, and members that did not have a program, but instead only had a single class in technical communication listed, were eliminated. Therefore, the population is biased in favor of writing programs involved in membership lists and with Web presence—indicating perhaps a bias toward more involved, tech-savvy programs. A total of 446 began the survey, while 334 finished the entire survey (see Rife, 2010, for a detailed discussion of survey recruitment and attrition issues).

A total of 155 programs were contacted via students/teachers, with 64 writing programs and/or writing majors as provided on the membership lists confirming response, for a programmatic response rate of 41%. A total of 334 participants comprising 41% students, 47% teachers, and 12% “others” from 64 technical and professional writing programs and/or writing majors completed the entire survey. The main variation between the actual population and the randomly selected participating population is that PhD programs participated on a significantly higher level than how they appear in the entire population, while two-year programs participated at a significantly

lower level. The study population subsequently is biased in favor of PhD programs and does not have adequate representation of two-year programs. The survey itself screens out anyone who had not created and published to the Web a composition such as a “web page, web space, wiki, blog, page on facebook/myspace or other social networking software application.” Thus, the results overall are biased in favor of more tech-savvy individuals.

The survey has six parts and 29 questions total, 15 one-part and 14 two-part questions. Areas of the survey explore levels of chilled speech, knowledge about copyright law, and attitude towards the importance of knowledge of copyright when writing for the Web. Survey responses are anonymous unless participants volunteered identities, and participants received no remuneration.

Interviews

Criterion-based sampling was used for selecting seven interviewees. For purposes of constructing interview questions, participant-authored Web compositions were collected. After locating interviewees in the survey meeting the criterion, a recruitment email was sent. Discourse-based interviews (Odell, Goswami & Herrington, 1983) were conducted between November 14 and November 30, 2007, and used in hopes of eliciting tacit knowledge and better understanding of writerly motivations behind specific choices made during digital projects. The interviewees include (pseudonyms used to protect privacy):

- Leslie, a former corporate professional writer with a great deal of technical communication workplace experience, now a PhD candidate in rhetoric and composition on the job market
- Rob, a second-year PhD student in rhetoric and composition studying in the United States but with Indian citizenship—also with a great deal of technical communications practitioner experience
- Jessie, studying toward a master’s in professional writing, finishing up her thesis and about to enter a PhD program
- Carey, studying toward a master’s in professional writing, also working full-time in a technical communications position at the educational institution where she studies

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- Sarah, with a recent master's in professional writing, working in her own start-up Web design business
- Amanda, a recent undergraduate professional writing degree holder, working as a communication specialist for a national health organization
- Heather, a junior undergraduate professional writing major working as a Web writer for various entities on campus

Data Analysis

Survey data were analyzed using traditional quantitative techniques in order to locate patterns and correlations across the populations with respect to variables. Interviews and other data were analyzed using qualitative techniques. Patterns, themes, and rhetorical topics (Haller, 2000) were extracted upon analysis from interview data. From each of the seven interviews, multimedia (visual/textual) vignettes were created as a form of data analysis (see Rife, 2012). Vignettes help the researcher formulate key issues toward the researcher's theory of what is happening (Miles & Huberman, 1994, p. 81). Interviewees received no remuneration other than a report of study findings and an answer key to the knowledge portions of the survey.

The 12 Key Findings

The 12 findings discussed here are the following. (1) Web spaces are sites of cultural collision, or common places, where writers occupy sometimes conflicting positions. (2) Web space writing intertextuality challenges traditional ideas of authorship, i.e., a single author working alone in a garret, producing texts from his or her sole creative genius (Foucault, 1984). (3) Digital writers' speech is not as "chilled" as one might expect, considering some of the literatures positing that copyright law chills speech. (4) A "mediational-digital composing heuristic" took shape during the research. This heuristic contains rhetorical topics like copyright law, but has others in addition (ethics, design, etc.). Copyright law turns out not to be the primary concern of digital writers in this study. (5) For this group of writers, ethics trumps the law in importance when considering digital composing choices. The next

seven findings are in more pragmatic areas than the first five findings, and concern copyright knowledge issues. (6) Misunderstanding of the difference between copyright and plagiarism. (7) Misunderstanding of the differences between unauthorized use and authorized use. (8) Misunderstanding of the government exception to copyright. (9) Misunderstanding of the fact that U.S. copyright law protects "creative" work to a higher extent than it protects "factual" work. (10) Clear understanding that U.S. copyright protects derivative works. (11) Digital writers are fairly certain about their own copyright knowledge and have a relatively stable confidence level regarding their own understandings of the law. (12) Knowledge of copyright law is important to digital writers.

Finding 1: Web spaces are sites of cultural collision, or common places, where writers occupy sometimes conflicting positions. In this study, the kinds of cultures colliding in cyberspace include contrasting workplace, educational, and international cultures, especially as those cultures understand authorship and attribution. Workplaces contain individual cultures (Henry, 2000), as do educational/academic disciplines (Hyland, 2000). Hyland's research, for example, illustrates how citation practices vary within disciplinary cultures. Obviously, different countries are going to contain different cultures—different rules, customs, and practices agreed upon by members of a community. A good example of cultural clash between the workplace and the educational institution arises when comparing how these two cultures understand repurposing or reusing materials. Copyright law is relevant in this clash because it helps to create and sustain "authors" by protecting the "creations of their minds," i.e., their intellectual property. To illustrate the clash, consider this quote from a recent document drafting book for practicing lawyers: "In contract drafting, plagiarism is a virtue. A lawyer drafting a contract should always try to start with a form designed for the kind of transaction involved, or from a contract previously used in a similar transition" (Fox, 2008, p. 42). In contrast, here is some typical boilerplate language from a standard U.S. writing course syllabus:

You must avoid plagiarism on all papers. Plagiarism consists of taking words or ideas from an outside source without properly acknowledging the source, or submitting a paper written by someone else. Plagiarism will result in a 0.0 on the first graded activity on which it occurs, and a 0.0 in the course if it reoccurs (WRIT 121, 2009).

Interviewees are or recently had been students, but all are digital writers. In the interviews it became clear the multiple cultures (workplaces, education, international) they participated in collided in their Web compositions. It turns out student-interviewees did not simply write for classroom assignments, but instead navigated extremely complicated identities and professional roles, surfacing in their Web texts some conflicting notions of authorship and ownership of texts.

One interviewee, Amanda, a recent 4-year graduate working for a national health organization as an online communication specialist, is supplied by her organization and its constituents with content for Web compositions. She regularly maintains its Web site and uses the organization's intranet. Amanda is involved as an alum with her undergraduate program, and generally finds it beneficial to stay marketable and keep her personal Web portfolio up to date and reflective of her current position and past experience. Yet her portfolio is forward looking as well, since she did participate in various professional activities, some of which are competitive—such as applying for an opportunity teaching abroad and seeking promotion and raises. In several areas of Amanda's portfolio, she features others' work she edited. Amanda incorporates texts, visuals, and designs created by others. She uses proofreading marks in her design she obtained on the Web and considers a fair use partially because she retrieved these marks from a university Web site used to teach students editing.

As far as copyright, Amanda is not terribly concerned about it. In her job, the employer provided forms others must sign to release their rights to donated materials, pictures, and texts. With the advent of user-generated content, such releases are crucial for Amanda to perform her job. She is well aware she is not the author of material she completes as an

employee and also feels a sense of responsibility as a representative of the organization to make sure the organization is presenting a uniform identity, and using others' materials fairly:

We have a—it's a publicity [form] and something else, and it's just like a legal document, and the person can sign it for interviewing and if it's a kid then the parents have to sign it . . . it has all the same sort of language that like our websites have when people want to share their story, or talk about their experiences, and they say that you can publish this in any way that you see fit, and they trust us, our organization, to use it, in a way that's not disrespectful, or judgmental about their character, or anything. This is basically to protect the organization, and the people who we are getting the stories from, so I think it's more a legal issue. . . and when you're writing stories for the newsletter, for the external newsletter, and anybody we interview, I give them the option to review it first before I publish it. . . so that they can see what we are saying. To make sure that they are comfortable with it being published, and I give them an option to say yes or no. It's just a courtesy. (Rife, 2012)

Clearly, Amanda navigates the Web with a sophisticated understanding of authorship. For her, she switches in and out of "author" position depending on whether she is working on her own or for her company. As an employee, it is the organization, not Amanda, standing in the author position. This switching in and out of author positions occurs for other interviewees as well.

Data analysis finding cultural conflicts arise between the academy and the workplace due to competing views of intellectual property and authorship, such as those faced by Amanda, also arise due to tensions writers face when working in opposing international spaces. One research participant (Rob) had been trained in a business setting he referred to as an "outsourcing" company in India to purposely evade detection by copyright law with respect to his globally networked digital writing.

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The Web writing Rob did for that company involves the creation of promotional pages that entice people to go to various companies' actual Web sites. Rob explained:

We didn't, didn't have the, capacity to be very creative, we just had to have the work done ... the content was humanly not possible to write, generate so much variety of content, for the same company, twenty pages, you know. I was allowed to use [others'] Web content provided that I jumbled up the words, because I had to write twenty pages for the same topic. (Rife, 2012)

So the company had its employees use existing content from the Web and jumble up the words, "put in our own spices," upload the pages on the Web, and then check the URL at copyscape.com, a Web site that lets you check to see if someone is copying your Web site. Instead of using copyscape for that reason, Rob used it to make sure the Web sites he created didn't "copy" another Web site too much, even though the content was taken from preexisting Web sites. In his former residence in India, the strategizing to avoid detection by copyright detection services was not viewed as either illegal or unethical. Rob explained:

In spite of the tremendous development in everything related to web in India, so much that huge chunks of web based projects are outsourced to India, why is copyright not as you might expect it to be? There could be a historical/cultural reason why we Indians do not think about it much. Knowledge is

a community-owned thing in India, and this concept dates back to the time before written language. The Vedas (ancient Hindu texts) were said to the word of God given to some sages and we never came to know which sage said what. This knowledge was passed on from generation to generation for a couple of thousand years. Re-mixing, re-mediating and re-interpreting is believed to have led to its growth and relevance to contemporary ethics. (Rife, 2012)

However, when the student writer began doctoral work in the United States, he faced a completely different paradigm and understanding of authorship and individual textual ownership. Traces of both views of authorship, one where the individual is cited and the other where it is not as important to cite the work of others, appears in Rob's and other interviewees' Web compositions.

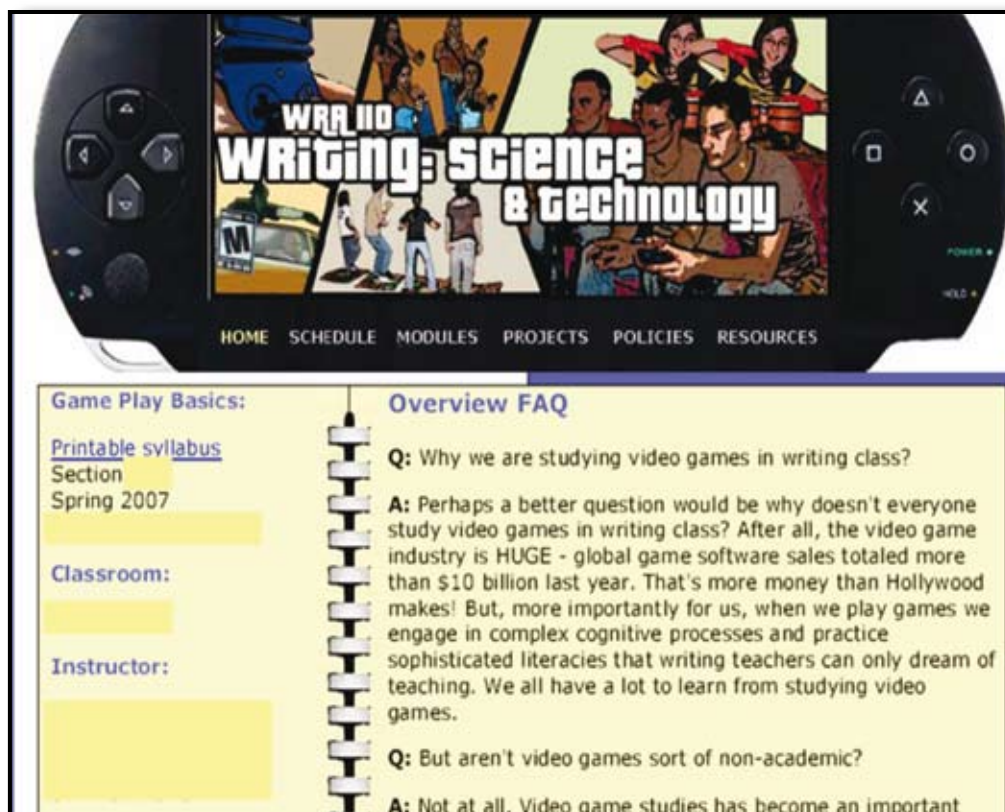


Figure 1. Screen Capture From Leslie's Web Page

Finding 2: Web space writing intertextuality challenges traditional ideas of authorship, i.e., a single author working alone in a garret, producing texts from his or her sole creative genius (Foucault, 1984).

Data analysis finds the single author is more of an idea, an ideological production rather than a reflection of authorship in Web environments. Interviewees illustrate how they remix (for discussions of “remix writing,” see DeVoss & Webb, 2008; Grabill & Hicks, 2005; Lessig, 2004, 2008; Ridolfo & DeVoss, 2009; Rife & DeVoss, 2010; Westbrook, 2006) others’ work in their own, take bits of this and pieces of that, mix in visuals, texts, and ideas from others in order to create their own final products. Leslie, a PhD candidate teaching first-year writing at a doctoral university, completes her degree and enters the job market around the time of our interview. She returned to school after working many years as a technical communicator at a transnational company. Prior to Leslie’s interview a Web composition (partially depicted in Figure 1) was collected from her in order to frame interview questions. Leslie designed a videogame-themed colorful course Web page for her first-year writing students. She wants to use a theme for her writing course that might draw upon her students’ interests while simultaneously involving the study of digital writing. Leslie said, “I wanted to have a cool site for them, when they first signed up.” In her Web writing, Leslie plays multiple roles, including that of graduate student, teacher, and potential employee-job seeker.

This Web space serves the pragmatic function of housing teaching materials, incorporating work Leslie did as a graduate student, and also showcasing Leslie’s Web design abilities and innovative pedagogies for potential employers. The gaming control and visuals are blended together by Leslie in a graduate visual rhetoric course, where she received feedback and even a grade from her professor. By the time Leslie teaches first-year writing, the gaming control visual as a graduate course project detached from its origins and is simply acting as a teaching and marketing tool for Leslie.

By considering Leslie’s multiple audiences and how she fashioned this Web text over a period of time (more than 1 year) with multiple underlying motivations illustrates the common place at work—a place of convergence of the past (graduate student), the present

(graduate teaching assistant), and the future (faculty member at new institution). The Web writing in this case collapsed time in that it placed the past, the present, and the future all in a 10" × 15" space. This same kind of phenomenon is seen in all the interviewees’ Web writing. Leslie remixed the Web text over a period of years, taking materials from a variety of places, and receiving feedback from others along the way. She explains the complexity of the visual featured in her Web text:

We’d just learned Photoshop that semester and I was playing with my new knowledge of Photoshop and doing cool things. So, it’s made up of like 100 different pieces. The major part of it is a PlayStation Portable; the console there, and then what I did was I took the part where you’d normally see the video game, and I replaced it with this composite image of my own, the name of the class, and the font used where it says the name of the course there, is actually a font developed for a particular game, Grand Theft Auto. It’s called Price Down. It’s a font they made for that. So I replicated that and did my course title with that name, and then it’s divided up into different pieces. I got that idea from, I saw it somewhere else. Somebody had a book cover that had like little pieces divided up into little frames, sort of almost like stained glass, and I wanted to do something similar. And so what I decided to do for that was, the emphasis in my class was going to be not on games themselves but on how people use games, so, all but the final corner image down here, all those images, the rest of the images, were actually people’s photos I found on flickr.com, I searched for video games, and I got pictures of real people playing video games, and then I cut out just the people that I wanted. I mean just the parts that I wanted. I traced, cut out the people, and I ran them through some kind of filter to make it look funky like they do. They look kind of stylized, almost like video games, and then I assembled them into these little

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frames, and put them in there, the ah, like, I said the only image here, that is not of real people is the lower left hand corner.

Leslie takes things familiar to students, a game control, game fonts, a look of “stained glass,” people playing games, a PlayStation Portable, typical Web page navigation elements, an image of notebook paper, a posting of office hours, and then blends that together with the newness of a new college course, an unfamiliar medium for a syllabus, unfamiliar connections of games to formal education, an unfamiliar combination of game control and Web page navigation links, and brought all of these images and allusions into a new light. This is the common place, the digital remix. And it triggers all kinds of copyright issues.

Fonts can be copyrightable and usually are in the context of gaming and branding; gaming control designs are copyrightable. All the visuals Leslie took from flickr.com may well have copyrights owned by others. Leslie did all this without permission. She is far less worried about copyright than about protecting people’s privacy,

especially the younger individuals featured playing games. That is one of her main motivations for applying the filters in Photoshop. She said, “I wasn’t really worried about copyright. I didn’t think anyone would come after me for taking their flickr pictures.” She did say she would be more careful about using these materials to make her remix if she was going to sell this image for a profit. But in the context of educational use, “I think for not for profit, for educational purposes I think that would be pretty low on anyone’s list of priorities for anyone to come after me about it.” However, Leslie’s Web text and interview, like those of the other interviewees, illustrates how the idea of “single author” does not hold up very well when analyzing Web compositions, since Leslie’s Web text emerged from multiple moments in time, and from mixing together “100 different pieces.”

Finding 3: Digital writers’ speech is not as “chilled” as one might expect, considering some of the literatures positing that copyright law chills

Table 1. Chilled Speech Index

	Yes	No	Can’t Answer	N
1. Have you ever been asked to take down something (text, audio, image) you had posted to the Web by a copyright holder or alleged copyright holder because the text, audio, image, etc., was allegedly infringing on the owner’s copyrights (for example, via a communication by way of a take-down notice or a cease and desist letter, or even an email)?	6%	94%		373
2. If so, have you ever actually taken down such material because of this request?	5%			
3. Have you ever voluntarily taken something down, on your own initiative, that you had posted to the Web because you felt you might be subject to copyright liability even though you never actually received a request to do so?	18%	78%	4%	373
4. Have you ever not posted something to a Web composition you were creating because of fear of copyright liability?	46%	50%	4%	373
5. Have you ever felt that the purpose or message of a Web composition you were creating would be better, clearer, or more aesthetically pleasing to the audience if you could use others’ copyrighted materials without fear of legal liability?	58%	34%	8%	373
6. Have you ever felt that you weren’t really able to say what you wanted in a Web composition because you were afraid if you said it the way you wanted, someone might sue you for copyright infringement?	14%	82%	4%	373

speech. While based on some literature (Heins & Beckles, 2005; Hobbs, Jaszi, & Aufdereude, 2007; Porter, 2005; Westbrook, 2006) expectations are speech might be greatly chilled due to fear of copyright liability, it turns out speech is less chilled than expected. While digital writers' speech is influenced, informed, and mediated by copyright law, their speech is not "very chilled" although in specific areas there is some substantial chilling of speech. As illustrated in Table 1 below, "chilled speech" is measured by a 6-point index exploring whether the writer had been asked to take others' copyrighted material down from the Web, had voluntarily done so, or had reflected on using copyrighted materials and decided not to even though the Web composition may have been improved. The six questions further asked whether the writer in general felt unable to express himself or herself due to restraints of copyright law.

On a 6-point scale with a score of 0–2 being "not chilled," 3–4 being "somewhat chilled," and 5–6 being "very chilled," only 2% of the population have very chilled digital speech. In contrast, 80% of the population does not have chilled speech, and 17% had "somewhat chilled" speech. Notably, only 6% of the population (N=373) were asked to remove Web materials by a copyright holder or alleged copyright holder.

Survey participants are influenced by copyright law, but it does not completely prohibit them from expressing themselves. Yet in some specific areas there is a substantial chilling of speech. A total of 58% felt "the purpose or message of a web composition [they] were creating would be better, clearer, or more aesthetically pleasing to the audience if [they] could use others' copyrighted materials without fear of legal liability," while almost half agreed they had "not posted something to a web composition [they] were creating because of fear of copyright liability." In contrast, only 14% felt they "weren't really able to say what they wanted in a web composition because [they] were afraid if [they] said it the way [they] wanted, someone might sue [them] for copyright infringement."

Digital writers consider and address copyright and fair use in their writing processes, something interviews show as time consuming and frustrating, but ultimately writers express themselves although perhaps not in a way as aesthetically pleasing as

they might think optimal. And yet, it is important to remember, as I discuss momentarily, the majority of these writers are willing to break the law on occasion if they think the law is wrong. This points to a possible lower level of law chilling speech than one might find with a different population. Plus, as I mentioned earlier, this population is likely more tech savvy and possibly more confident about avoiding potential copyright liability than a more general population of writers might be.

Finding 4: A "mediational-digital composing heuristic" took shape during the research. This heuristic contains rhetorical topics like copyright law, but has others in addition (ethics, design, etc.). Copyright law turns out not to be the primary concern of digital writers in this study. Interview data show that the mediational considerations, the rhetorical topics made by digital writers, fall into five basic categories:

1. Ethical Considerations: Ethical/political considerations including considerations of attribution
2. Design Considerations: Issues of design/content rather than issues of copyright as influencing composing choices
3. Faith/Religion: Reasoning based on one's cultural background, religious beliefs, or faith
4. Employer Demands or Requirements: Reasoning based on the demands or requirements of one's employer
5. Copyright and Fair Use Considerations: Using, applying, referencing copyright law such as asking permission, considerations of originality, etc. Referencing fair use or the four-factor fair use test of Section 107 (fair use elements such as educational use, amount used, size, etc.)

While data do not give us enough information to judge exactly how these topics were prioritized in writers' minds, based on both the survey and interviews, ethics is more important than law among this group of digital writers. Leslie, for example, is more interested in protecting the privacy of children featured playing videogames in the images she appropriates than she is about potential copyright violations for remixing the image.

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Figure 2 illustrates the mediational heuristic at work when writers in this study compose for the Web. Each element in the circle of rhetorical topics mediates invention. These rhetorical topics interact together as the writer weighs and balances the import of each one—i.e., the probable knowledge factor. Probable knowledge requires interaction of all available rhetorical topics, and is thus represented as encompassing. Since other inventional theories do not explicitly state their theory of authorship (Kenneth Pike's tagmemics, Kenneth Burke's dramatistic pentad, Gordon Rohman's prewriting, classical invention, etc.), and my research shows in digital spaces, the single author is a figment of the imagination, it is wise for researchers, teachers, and/or writers to have an explicit theory of authorship in mind as they move forward. Existing inventional writing theories implicitly rely on an author as a solitary genius, a perpetual surging of innovation. In my research I took into account remix writing, and the idea the author is inherently multiple, and much more complex than a single actor or person. Whatever theory of authorship one has as one moves forward in implementing or imagining an inventional heuristic is no doubt going to shape the outcome. In this research authorship is found to be extremely complex, with writers pulling from multiple sources, and Web texts taking months if not years to complete. It is not uncommon for a Web text to be written by many people switching in and out of the author position consecutively, and taking care of that Web space over a period of years.

Probability thinking, a hallmark of invention and part of the heuristic, allows writers to prioritize and chose among whatever rhetorical topics they decide will be most influential in their writing choices. Digital writers in the study are willing to appropriate and use copyrighted materials if they think they will not be caught in the

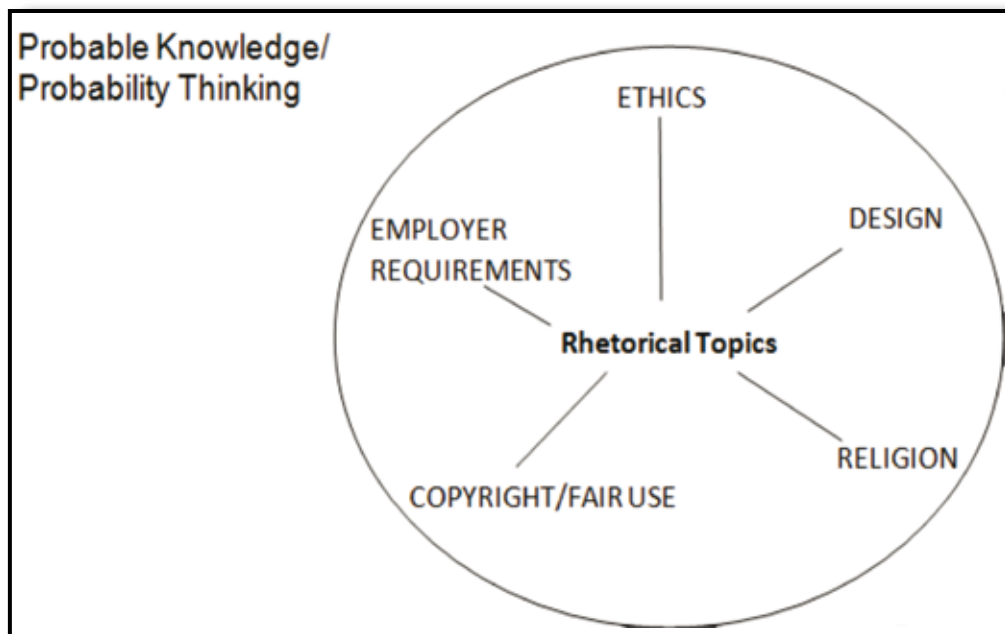


Figure 2. The Mediational-Digital Composing Heuristic

context of their low-visibility use. They are willing to do this because they overwhelmingly think U.S. copyright law is overly restrictive, especially in educational contexts where materials are appropriated in order to learn and teach, not for commercial profit. All the interviewees had different ethical stances when asked about selling their own texts for profit. In that case, many would not feel comfortable because they did not have proper permissions for using the copyrighted materials they did. Instead of advertising or proclaiming their use to the world, they quietly took what they needed, and sometimes went to great efforts to disguise this use by transforming the original copyrighted material. An earlier research participant from the pilot study (conducted prior to the full-study reported here), Shauna, circumvented anti-access technology on a DVD in order to take bits and pieces of popular movies for an educational montage critiquing racial stereotypes perpetuated in movies. Although she knew this was a violation of Title 17, specifically the portion commonly known as the DMCA (Digital Millennium Copyright Act), she circumvented the digital rights management technologies (DRMs, such as encryption codes that prevent hacking taking clips from movies) anyway because, she said, the law prohibited “fair use.” She also thought she would not be

caught, and if caught the worst that might happen, she surmised, is she'd be asked to take the material down from the Web. Shauna's interview provides an example of both "ethics" trumping legal considerations, and probability thinking—the cool calculation of possibilities when making composing choices. The mediational-digital composing heuristic depicted in Figure 2 is an inventional heuristic for digital writing, at least for the interviewees in this study.

Finding 5: For this group of writers, ethics trumps the law in importance when considering digital composing choices. Shauna provides a good example of ethics trumping the law. Leslie as well provides an example because she is more concerned with protecting people's privacy (an ethical concern) than abiding by copyright law. The same is true with Amanda, who asks permission to use others' texts, texts she's edited, even when she could have used without permission under "fair use." Amanda also has detailed attribution information throughout her personal Web portfolio—she thought this was the right thing to do, and also it illustrated her awareness of attribution as a strategy of professional collegiality. Amanda also has copyright information on her own Web pages showing her work as copyrighted. But when asked about this, she made clear she is not concerned with others appropriating her work, but wants to show her copyright awareness. She feels "copyright 2006" is a proper rhetorical element in a Web page—showing in this instance design is more important than copyright.

That ethics trumps the law is supported in both the survey question and the interviews. The question was asked in the survey: "In general, would you say that people should obey the law without exception, or are there exceptional occasions on which people should follow their consciences even if it means breaking the law?" Of the 384 respondents to the survey, 73% would follow their conscience rather than the law on exceptional occasions, while only 14% would obey the law without exception. The question was taken directly from the GSSDIRS General Social Survey 1972–2000 Cumulative Codebook.

As interviewee Carey points out, you have to break the law sometimes "because I mean we wouldn't have all the civil rights, the law now, we wouldn't have it

unless people stood up to the law." The seven interviews certainly support the idea digital writers are more concerned about attributing, asking permission, not harming others, than they are about legal violations.

Sarah, with a recent master's degree in professional writing, working in her own start-up Web design business, has deep concerns about implications of her use of others' content, not with respect to herself, but with respect to the church she writes for. "The whole thing was just really confusing to me, but because I was getting paid for it, it made me, it wasn't like in school where I didn't really worry about it because it wouldn't really matter, like, I didn't want this to come back to the people I'd done it for."

The 300-plus survey takers are aware of legal and ethical implications of Web writing as evidenced by an average score of 63% on the knowledge portion, and by 73% responding to the question on ethics versus law, stating on occasion it is acceptable to follow your conscience rather than the law. All 7 writers interviewed have this awareness of legal and ethical implications. Undergraduate student Heather tacitly screened photos her employer sent her as Web content since she knew of possible negative implications for people featured in those photos (students, teachers, and other professionals). Leslie used Adobe filters on flickr images in order to protect young game players' identities. Carey, an employee at a doctoral university and working toward a master's in professional writing, kept her social network site content free in order to protect the institution and its connection to her professional identity. Amanda had the same kind of concerns with her Web persona and her organization's identity.

When Amanda is asked whether legal-ethical issues arising from using others' materials arose in her undergraduate professional writing program, particularly her editing courses, she stated, "No. No it wasn't discussed." So she independently decides it is unethical to use someone else's materials without their permission even in the case of doing it to illustrate her own editing skills acquired at an educational institution. However, she did sometimes include the original when blended with her edits. She explicitly tells me her pressing concerns when writing for the Web are ethical, not legal. For a number of interviewees, even though they could use material under fair use without receiving permission,

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they request permission anyway not because of fear, but because in their minds it is the right thing to do.

Why ethics trumps the law can only be speculated upon without further research. It could be because writers have been taught more about plagiarism, attribution, and permission than they are taught about copyright law. We cannot know the answer to this without conducting another study that might trace where and to what extent writers obtain their knowledge of ethics, law, religion, etc.

Notably, regarding the GSSDIRS Codebook question used, Robin Collins (2007) reports at one time the question was administered by blind ballot to an audience of 20 “humanists,” where 100% selected that one should “follow their conscience.” Collins reports results on this question in the international community. Sample results include the United States, where 42.7% would obey the law without exception, while 57.3% would follow their conscience. In Canada, 25.1% would obey the law, while 74.9% would follow their conscience. In France, 15.2% would obey the law, while 84.8% would follow their conscience (Collins, 2007). We might draw the conclusion here students and teachers in professional writing are more humanist than the general U.S. population. However, Collins (2007) also has data showing as educational level in the United States increases, so does the willingness to follow one’s conscience over the law on occasion. The results in this study support Collins’s reporting, since a significant number of individuals taking the questionnaire have advanced degrees, and all have at least some formal education—and are situated in a field often associated with the humanities. The results here then should not surprise us. However, results might be drastically different if administered in a formal workplace setting or corporation where an “ethical” decision that is not also “legal” could have grave repercussions for the organization. It’s imaginable that it might be very difficult to move from academic cultures and the luxury of acting autonomously in one’s writing decisions with respect to ethics (like “it’s ethical to break copyright law because copyright law is too restrictive”), into formal workplace settings where an ethical decision to violate copyright law could bring serious legal liability to the organization. This is an area where further research may be warranted.

Finding 6: Misunderstanding of the difference between copyright and plagiarism. The survey contains a question I refer to as “The Plagiarism Question” and asks: “The single most important thing U.S. courts look at when deciding whether or not a particular use is a fair use, is whether or not the original author has been attributed and/or credited.” The best answer is false, but 49% answered “true.” In the United States, attribution is not an element of a fair use analysis, although it might be taken into account by the court. It is certainly not “the single most important” factor courts consider. The only exception to this is if a work of “visual art” is used (Title 17, Section 106A, U.S.C.; Section 101 defines “visual art” as a painting, drawing, print, sculpture, or still-life photograph existing as a single copy, or in a limited edition of 200 copies or fewer that are signed and consecutively numbered by the author). *Digital* visuals are not protected by Section 106A. Attribution is important for the ethical doctrine of plagiarism—a doctrine of great concern to those in academia, but is not part of a fair use determination. In fact, many fair use cases concern items where attribution is not important, such as in the case of parody or satire. In responding to this question, participants show misunderstanding of the differences between the ethical doctrine of anti-plagiarism and its requirement of attribution, versus fair use, which does not require attribution. With respect to “The Plagiarism Question,” 340 participants respond, 49% are wrong, yet 60% feel at least somewhat certain they are correct.

A reason for this pronounced misunderstanding, a finding confirming a previous pilot study finding (Rife & Hart-Davidson, 2006), is the academic institution’s emphasis, bordering on obsessive fixation, with attribution and documentation of “authors.” This fixation is likely due in part to the economy of symbolic capital via attribution. In other words, tenure and promotion at the university are tied to how much one is cited by others, how much one’s scholarly work is taken up. In contrast, in for-profit environments, promotion is instead tied to how much financial profit one produces. This is an area where more research is needed because it is unwise to grossly generalize an attribute of the population based on responses to a single question. Yet, the misunderstanding of differences between plagiarism and copyright arose during interviews, with an overemphasis

on the importance of attribution. Be clear. In copyright situations, even if attribution occurs, it will not shield a user from legal liability for copyright infringement.

Finding 7: Misunderstanding of the differences between unauthorized use and authorized use. A use of copyrighted material is either unauthorized, such as a use under Section 107 “fair use,” or an illegal use. If the use is not unauthorized, it is authorized, such as with express permission or under a Creative Commons or some other form of license. Across the population, understanding of the authorized versus unauthorized use is less than what one might hope.

Fourteen knowledge survey questions tested three areas. Eight questions test whether writers understand basic elements and protections of fair use per Section 107 of the statute. Five questions examine writers’ understanding of the differences between the right to use someone else’s materials in context of authorized versus unauthorized use. For example, the questions explore whether writers know the difference between using with express permission, using under a license like Creative Commons, using things that are not copyright protected, and using under the fair use doctrine. One question, “The Plagiarism Question,” explores writers’ understanding of the difference between the ethic of anti-plagiarism and the considerations of the fair use doctrine.

For global views of this population’s scores on the knowledge portions, only those who finished the entire survey (N=334) are included. The average score for the entire 14-question set on copyright/fair use knowledge is 63%. Based on a traditional grading rubric, where 70% is around a 2.0, or adequate, the average score for the entire population falls short of “passing.” On the other hand, considering the complexity of the subject matter and the questions themselves, and considering professional writers are tested in an area some see as the exclusive domain of \$300-per-hour intellectual property lawyers, 63% is a remarkable accomplishment.

The average score for the five questions on licensing versus fair use, or authorized versus unauthorized use, is 51%, indicating some misunderstanding in this area. Interviewees note they are concerned about their lack of understanding about Creative Commons and exactly what it means to use

with a license. Interviewees are confused about the fact items on flickr.com or other sharing Web sites might be licensed in particular ways. They sometimes assume if something is posted to a Web site, anyone can use it for any reason. Some interviewees read licenses, and some did not. In contrast, the average score for the eight fair use/copyright questions is 71%, indicating greater understanding in this area.

Finding 8: Misunderstanding of the government exception to copyright. One area of clear misunderstanding that surfaces in the survey is a misunderstanding of the government document exception to copyright (see Title 17, Section 105, U.S.C., for details). The survey question read as follows:

Mary, a law abiding citizen, decides to use five pages of a seven page ninth circuit court decision in her website. She legally obtains this unedited opinion directly from the court’s website. She wants to cut and paste all five pages directly onto the html page she is composing. She will not edit or comment on the court opinion, nor does her webpage allow commenting by others. Before using the text in her website, as a conscientious, law abiding person she should be sure she is within fair use.

While the amount used is normally an issue in a fair use determination (“five pages of a seven page opinion”), in this case that shouldn’t matter because an unedited Ninth Circuit court decision is a government document and thus in the public domain. In a fair use determination, normally it would matter how much synthesis the new author conducts, and whether the use is for research or critique. While the question points out Mary isn’t doing any of that, it should be irrelevant because a federal judicial opinion is not copyright protected—at least that is the “best answer” in this circumstance, and survey participants were prompted to provide the “best answer.” The best answer in this case is false, because Mary does not need to do a fair use analysis even if she is a law-abiding citizen. In fact, a law-abiding citizen would know about the government document exception to copyright in the United States.

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(Obviously, money and stamps are exempted from this leeway in copyright protection!).

Yet, 68% of the respondents said Mary should do a fair use analysis, and 67% were very or somewhat certain they are correct in their answer. Pragmatically, it might not be that important to U.S. professional writers that they can use most U.S. government-authored materials without concerning themselves with copyright and fair use. But on a more political level, this misperception is important.

In the United States, as distinct from other democracies or other forms of government (monarchies for example), federal government documents generally aren't copyright protected. The fact the savvy and educated participants taking the survey aren't hearing the words of Lincoln's Gettysburg Address—"government of the people, by the people, for the people"—as they consider authorship of government documents is troubling, since the authorship status of government documents in the United States is one of the clear markers that separates it. A copyright information Web site sponsored by York University points this out:

In the United States, documents prepared by the government are generally considered to be in the public domain, and thus have no copyright protection. In Canada, however, the Crown owns copyright in government documents ("Copyright and You," n.d.).

In the political climate of late 2007, at the end of the George W. Bush Administration, some U.S. citizens, especially the humanists, felt very detached from government-authored actions. One wonders whether this sense of detachment seeps into our perceptions of who owns the government (and the knowledge it produces).

Finding 9: Misunderstanding of the fact that U.S. copyright law protects "creative" work to a higher extent than it protects "factual" work. What is "creative" work? If any group challenges traditional notions of "creative" writing, it is professional writers. While the master narrative defining creativity might label it as producing items like poetry, paintings, short stories, sculpture, novels, and so on (poetry and fiction are the exclusive domain

of the "creative writing" course at my institution), anyone who has either produced or critiqued an instruction manual appreciates the vast creativity involved in constructing a text that appeals to and is understandable by a broad, often global, audience. Yet, in the United States the more traditional definition of creativity is drawn upon in determinations for purposes of copyright protection and fair use.

Fair use is less likely to cover a use of someone else's creative work. One of the fair use four factors in Title 17, Section 107, U.S.C., looks at the nature of the copyrighted work. Courts generally do not find "factual" material to be "creative" material. For example in *Stewart v. Abend* (1990), the court focused on copyright protection of the owner's exclusive right to create derivative works and did not find fair use. Cornell Woolrich is the author of the story "It Had to Be Murder," and the 1954 film *Rear Window* is based largely on Woolrich's story. When MCA, Inc. rereleased the film in 1971 without securing rights from the party who had been assigned Woolrich's copyrights (Woolrich had since died), suit was brought. The court held the film was not a "new work" falling under the protection of fair use. The four factors were taken into account by the court: the infringing work was commercial (factor 1, purpose of the use), the original work was creative rather than factual (factor 2, nature of the copyrighted work), and the rerelease harmed the copyright holder's ability to find new markets (factor 4, effect on market). In this case, the creativeness of the infringed work was one of the factors that, added with the others, caused the court to find this use was not fair.

When asked about the issue of creative versus factual work, the survey participants overall were not aware of the differences, with 58% answering that creative and factual work are equally protected by copyright, while only 42% thinking creative work has different protection than factual work. The misunderstanding could derive from the field's tendency to challenge concepts like "creative" and "factual." It could also derive from the field's more sophisticated understanding of genre.

Finding 10: Clear understanding that U.S. copyright protects derivative works. One area where the study population evidences clear understanding of copyright law is regarding the ability to create derivative

works from another's copyrighted materials. The survey question asks: "The owner of a copyrighted novel has failed to make this novel into a play. You decide to do so without the copyright holder's permission. Your derivative work, the play, closely follows the plot and characters in the novel, but is likely to be a fair use because it is different than a novel." The best answer here is false, since a play is obviously a derivative work based on the novel, and would impair the copyright holder's future market. A novel is also a creative work and so has more protection than something like a factual report. The participants overall had a very clear understanding of these issues, as 95% out of 350 selected the best answer (note: 350 responded to this question, while 334 finished the entire survey). The clear understanding perhaps emphasizes the academic economy of symbolic capital via attribution and the importance of retaining the ability to control the destiny of one's works. It might be that the survey respondents feel they were stakeholders along with the novelist, but removed from items authored by the U.S. government.

Finding 11: Digital writers are fairly certain about their own copyright knowledge and have a relatively stable confidence level regarding their own understandings of the law. After each of the 14 knowledge questions, participants are asked to specify how certain they are in their answer, with 1 being "very certain" and 5 being "not certain at all." The study explores whether there is some empirical data available to support the general statement individuals are confused and uncertain about copyright law and/or fair use, an argument used to support the assertion such individuals are thus fearful of fully expressing themselves when composing for the Web (i.e., "chilled speech"). However, such empirical data was not generated. The average certainty score for the entire population is 2.3—i.e., somewhere in between "somewhat certain" and "not too certain"—indicating that as a whole, the population is aware of its lack of knowledge (if the average certainty score was closer to 1 ["very certain"] with an average test score of 63%, we would have much more cause for concern).

In a utopian world 100% of the survey respondents would receive 100% on the knowledge score and a 1 on the certainty score. That is, they

would have high knowledge and lots of confidence. But for 100% of each of the 14 questions, the majority of respondents answered "somewhat certain" (a 2 on the 5-point scale) regarding their confidence level. Unlike a number of claims made in recent scholarship that individuals are extremely uncertain about copyright and fair use (Hobbs, Jaszi, & Aufderheide, 2007; Westbrook, 2006), the data here indicate a fairly stable confidence level. The study also finds no correlation between knowledge and confidence, and in some instances finds with more knowledge there is less certainty in that knowledge. This makes sense because the more aware one becomes of the variables at play, the rhetorical topics at play in any composing decision, the more uncertain one might become. But here again, we need further research.

Yet if respondents are in fact extremely unsure, we would have seen a lower average certainty score—perhaps closer to 5: "not certain at all." If respondents felt extremely lost and confused, we would have seen the majority selecting "not too certain" rather than "somewhat certain" in at least some locations of the survey. However, we do have to take into account the potential biases in the responding population. These individuals probably are more tech savvy and knowledgeable about copyright and fair use, and so that as well could explain respondents' relatively high and stable confidence levels. Participants who are very uncertain about their knowledge may have been the ones who dropped out of the survey. We cannot know this for sure.

By examining certainty levels with respect to each question, we can also examine, in a sense, "how wrong" the respondents are in their answers. It is interesting to think about degrees of wrongness—as in a typical multiple choice test, an answer is either right or wrong. However, it is my theory if a respondent answers a question wrong but is not very certain about his or her answer, then that respondent is in a way less wrong than a respondent who answers wrongly but is very sure he or she is correct. This is not a variable I have seen tested before. But, overall from this examination, the respondents are somewhat certain about their answers, on average, and also have an overall average knowledge score of 63%. This, I argue, is an indication this population has some level of awareness of its

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“wrongness” or misunderstanding—perhaps also indicative of a willingness to learn, but the later statement we cannot know for sure without further research. However, we do know from the data this population of writers has a keen interest in learning more about copyright law.

Finding 12: Knowledge of copyright law is important to digital writers. A survey question asks respondents how important they think knowledge and understanding of copyright and fair use is to their work. Findings show the vast majority of professional writing teachers and students believe knowledge of copyright law is important to their work as digital writers. Only 1% think such knowledge is not important. A full 98% believe such knowledge is at least somewhat important, with 79% stating knowledge of copyright is either important or very important. Almost half of those participating think knowledge and understanding of copyright is very important.

Implications for Teaching, Learning, Research, and Practice

The findings of this study show a vast majority of professional writing teachers and students believe knowledge of copyright law is important to their work as digital writers. Yet, they scored only 63% overall on the survey’s knowledge portion. We might explore the idea that teaching copyright law in technical and professional writing should become the norm. Professional development for working technical writers is also in order, since at least for this population, knowledge in this area is not being gained in formal educational settings, at least with the robustness we might hope for. Interviews show digital writers want to learn and engage with *all* the various laws that impact professional writing, such as privacy law, defamation law, and contract law. Teaching copyright might be folded into a core course or a professional development seminar where the laws of public writing in general are taught.

This study finds the single author is an ideological production at least with respect to the production of Web texts. And if the author is not working in solitude even though he or she is “alone,” if digital writing travels

through space and time and collapses the past, present, and future all in a 10" × 15" space, then we have to consider cross-cultural issues, issues of attribution and plagiarism, and issues of collaborative work in an entirely new light. Situating U.S. copyright law restrictions in a cross-cultural, international context may deeply impact how copyright law is taught or understood. At this point, though, we do not have any comparative data to show how copyright law might influence composing processes of writers in countries other than the United States. As I mentioned, international intellectual property issues add a layer of complexity to an already complex topic. But this is an area where we need further scholarship and exploration. These types of laws should certainly impact how we approach the practice of technical communication.

Considering how central writing is due to the Web, we really need more empirical studies on digital writing processes. We need additional theories that help us understand why inventional heuristics work sometimes but not other times (see Welle Donker-Kuijer *et al.*, 2008; De Jong & Schellens, 1997, 2000; De Jong & Van der Geest, 2000). I offer the digital composing heuristic I developed in this study to be tested, explained, expanded, and explored with further research. Studies involving the exploration of cross-cultural inventional strategies in digital writing contexts are needed, as are studies involving authorship in the workplace and how that might differ from authorship in the classroom (see Portewig, 2008, and Reyman, 2008, for recent examples).

While it was not the focus of this study on copyright law, as I interviewed digital writers I learned something possibly very important about the so-called practitioner-academic divide. That is, the divide may be far less clear-cut than one might imagine. To my surprise, *all* the students interviewed were also practicing technical communicators in one form or another. Several had been previously employed full-time as technical communicators and so brought their experience and perspectives with them to their coursework at the university. I leave this study with the distinct impression the practitioner-academic divide is far less a bright line than is usually presented. This area would benefit from further inquiry. Understandings in this area might assist with audience analysis—for

example, the digital writers I interviewed, as readers, need knowledge at the intersection of practice and academia—and it is not uncommon for writers to straddle these two domains for extended periods of time. Therefore, to divide a readership into “practitioners” and “academics,” I think, is a simplistic divide. The affordances of Web writing appear to allow writers to perform many roles simultaneously in ways we have yet to imagine.

For technical writers who design EULAs (End User License Agreements) or Terms of Use for various digital interfaces, the findings from the study might be instructive because the mediational-digital composing heuristic contains rhetorical topics motivating users to make choices on whether or not to appropriate and/or remix content. My research shows that in some cases, ethics is more powerful than law in writers’ decisions. Therefore, in order for EULAs and Terms of Use to actually be effective, they may have to play upon the topics that are mediating content choices. Further, since the study finds users may have marked misunderstandings of basic copyright issues, specifically issues of licensed use or use with permission, those who want EULAs and Terms of Use to actually be understood and used may have to consider writing plainly, offering explicit guidance, and explaining basic information. The writers in my study want to do the right thing and, if given an intelligent and understandable rationale for doing so, will likely heed reasonable requests to use content in particular ways.

Findings in the study showing the emphasis digital writers place on attribution (such that pragmatically “attribution” requirements obtain the force of law) may point to possible culture shock as professional writers trained in academia enter organizational work environments. Such work environments often retain attribution for the organization, or for key figures within that organization. What might be considered “plagiarism” in academia may be the normal mode of operation in the organization. Therefore, organizations might take special care to clarify authorship policies and procedures. Further, educational institutions may want to work harder toward helping students understand the ways in which paradigms of authorship differ between workplace and educational cultures, or in international contexts. Service-learning activities may be a good place to work in such curriculum.

Very clearly, this research provides empirical data showing professional writers do not feel they have been properly educated in their writing programs or professional development with respect to legal implications for entrepreneurship, organizational/corporate authorship, and collaborative or joint authorship. They have been inadequately educated as well on how to exploit their own intellectual creations *for profit*—which is a key understanding to business success (Faber & Johnson-Eilola, 2002). One recent graduate from a master’s degree professional writing program, Sarah, now working as a professional writer, said:

I think so much everything I’ve encountered is different than how we did it in class . . . I mean I just wish, I love the different things we learned in school, but the focus was really on work you do in the classroom, and I think about all the time we were building stuff in class where I wished we had pretended we were doing it for commercial reasons. And so that we really had to talk about the issues, and think about them then as opposed to sort of ignore them because we were safe then.

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Capabilities and Roles of Enterprise Wikis in Organizational Communication

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Abstract

Purpose: The article alerts technical communicators to wiki technology, an emerging new medium that allows dispersed groups to create shared content via collaborative editing and different-time communication. Wiki-based collaborative content creation enables new communication practices and thereby challenges several assumptions of existing media choice theories.

Method: Analysis of empirical evidence from 32 published case descriptions and reports to evaluate wiki technology in a corporate context based on the defining characteristics of three media choice theories (i.e., media richness theory, theory of media synchronicity, and common ground theory).

Results: Wikis meet or exceed capabilities of several other communication and collaboration media, and thus provide a credible alternative to other business communication technologies currently in use. Further, distinct media capabilities of wikis are not fully represented by current media choice theories, suggesting the need to extend media choice theories to recognize these unique capabilities.

Conclusion: The unique features of enterprise wikis enable new collaboration practices and challenge some of the core theoretical assumptions of media choice theories. The refactoring capability of wikis is identified as a unique feature that enables new forms of collaboration and communication in organizations. An implementation that wishes to successfully leverage wiki-enabled collaboration opportunities must carefully consider challenges of human interaction such as free-riding, or conflict of values.

Keywords: Wiki; Content refactoring; Collaborative writing; Media capability; Business communication

Practitioner's Takeaway

- Wikis support a considerable variety of communication activities and provide a credible alternative to other business communication technologies currently in use.
- Their unique refactoring capability allows wikis to support communication processes which are usually associated with those communication media that provide a high social presence (i.e., processes of negotiation and consolidation).
- Wikis can also serve as documentation and negotiation platforms that complement face-to-face communication.
- Implementing a wiki in the organizational context requires careful decisions whether to adopt the open principle and allow every staff to overwrite the existing content, or to impose restrictions and allocate formal editing roles.

Introduction

Wikis are a recent innovation in information technology with the potential to significantly alter communication practices in organizations. Evidence of this opportunity is available on the public Internet, where a large number of wiki-based communication and collaboration platforms allow distributed users to create and discuss content collaboratively. On Wikipedia, Wikitravel, or Wikinews, collaborators not only write the content jointly, they also discuss it in parallel on the sites' discussion pages. For some encyclopedic entries on the popular Wikipedia.org platform, more than 100 users have contributed to the content creation, thereby integrating their knowledge and skills (Voss, 2005). The success of these online wikis has sparked considerable interest by organizations to adopt this technology to support their internal communication and collaboration processes. A report by the Gartner Group has predicted that by the end of 2009, half of all Fortune 500 firms will have adopted wiki technology (Shreeve, 2007). Although this prediction has not yet been confirmed, it suggests a strong belief in the impact and desirability of the technology. Several proponents of wiki technology even expect that wikis will become the internal communication media of choice for organizations and go as far as to state that it will effectively replace email (e.g., Mader, 2008). Corporate examples such as Google's "Goowiki" intranet demonstrate the conviction held by some companies about the benefits of replacing traditional technologies for organizational communication with wiki technology (Goowiki, n.d.). What justifies these strong beliefs in wiki technology as a tool for communication and collaboration? Our article attempts to answer this question from the perspective of media choice theories.

In order to understand the potential impact of wiki technology and to grasp its implications for the technical communications profession, it is useful to analyze wiki capabilities and to compare them with other established communication and collaboration tools, so as to assess the task-technology fit (Maruping & Agarwal, 2004). In this article we therefore evaluate wiki technology based on the defining characteristics of three media choice theories, drawing on empirical evidence from 32 published case descriptions and reports. We identify that wikis meet or

exceed capabilities of several other communication and collaboration media, and thus provide a credible alternative to other business communication technologies currently in use. Our literature-based research also reveals that the distinct media capabilities of wikis are not fully represented by present media choice theories, and that there is a need to extend them in order to allow for these unique capabilities. We conclude by discussing the implications enterprise wikis have for the role of technical communicators.

Wikis in the Enterprise

Wiki technology and the principles of wiki-based collaboration have gained significant popularity through online encyclopedias such as Wikipedia.org, which has become one of the 10 most popular Web sites in the world (sixth most popular site since September 2009, according to Alexa.com). However, in its original conceptualization wiki technology was not developed for the purpose of a public Internet-based encyclopedia but as an internal communication and collaboration platform. The inventor of wiki technology, Ward Cunningham, originally developed the c2 wiki (also known as "Ward's Wiki") to support the effort of his project team in maintaining version control for a software development project. The underlying design objective was to create "the simplest online database that could possibly work" (Leuf & Cunningham, 2001, p. 15). The c2 wiki quickly metamorphosed into an open knowledge-sharing and collaboration environment, and is still maintained by a large community of software developers. Its popular use as a technology platform for the encyclopedia Wikipedia arose only several years later in 2000, when Larry Sanger and Jimmy Wales were looking for a collaboration technology to overcome their stalling initiative to create a free, online encyclopedia (Sanger, 2005).

Wikis are best explained within the larger context of social software. Social software is broadly defined as "software that supports group interaction" (Shirky, 2005, p. 185), which also includes other Internet-based applications such as blogs, networking sites, and social bookmarking tools. The key attributes of wikis and other social software tools are the following (Parameswaran & Whinston, 2007): content is created and controlled by the users; content is highly dynamic with frequent, often unpredictable

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changes; quality assurance of the content is largely peer-based and unstructured; social software applications themselves are mostly lightweight, platform independent, and highly portable. The emergence of social software and the underlying concept of user-generated content have important implications for communication research. Sonia Livingstone (2003) explains, for instance, how social software transforms the role of the audience from being a passive observer to being an active participant. She suggests that in these social software environments what is traditionally defined as “audience” should be redefined as “users” to better account for the ways individuals actively engage with these social software tools.

Wiki technology adds a new facet to the concept of user-generated content. While in other applications such as forums, blogs, or social networking sites the content generation process resembles a mosaic of separate individual contributions, the wiki-based content creation process describes a confluence of individual contributions. It is one of the basic design principles of wiki technology that “the structure and text content of the site are open to editing and evolution” (Cunningham, n.d.). Based on this design principle, wiki users *refactor* (Fowler, Beck, Brant, Opdyke, & Roberts, 1999) content that has been posted earlier and thereby modify, extend, or adjust its meaning. The refactoring capability of wikis allows for new communication practices. Instead of passively reading content that has previously been posted on the wiki, users actively *edit* content. This has interesting knowledge management implications, as wikis are not limiting communication to the exchange of information (as in the case of email), but allow for the integration of information and the creation of new knowledge artifacts. The refactoring process enables a higher-order communication process that bridges the boundary between communication and collaboration: by editing each other’s content, users not only communicate their perspectives or share their information but also contribute to the creation of new or enriched content.

To some extent, wiki-based content creation is comparable to the process of collaborative writing, with distributed individuals integrating their expertise into one jointly created document. The main difference between collaborative writing and the editing process in a wiki environment is the *open principle*: in a wiki-based environment, no coordinator distributes tasks or

consolidates the distributed efforts. The users themselves decide how they can best contribute to the content creation process. Moreover, wikis provide more facets than traditional collaborative writing environments, blurring the line between the use of the wiki environment as a collaboration and communication tool. Some project teams, for instance, use the wiki as a shared communication tool to replace email communication, with the added benefit that the aggregate communications are made persistent, so as to create a “collaborative work product” describing the project work. Other teams may focus less on communication, but specifically target joint development of a shared knowledge asset. The underlying technology characteristics reflect this duality of collaboration and communication. The widely popular Mediawiki platform (e.g., used by Wikipedia), for instance, contains both content pages and “talk pages.” If the content pages themselves are used mainly for collaborative content creation, then the talk pages enable an ongoing discussion about the collaborative effort. This separation between collaboration and “talk” occurs in other wikis through the comment function (e.g., Twiki, Tikiwiki) or through writing “above the line” for collaboration and “below the line” for communication in other wikis (e.g., c2 wiki).

Although wiki-based communication and collaboration practices have demonstrable advantages (Wagner & Bolloju, 2005), they also create a number of challenges. The process of collaborative content creation is predicated upon the fact that users integrate their diverse perspectives such that the overall content converges toward common agreement (Leuf & Cunningham, 2001). Convergence, however, is not necessarily guaranteed, and instead of integrating each other’s perspectives, users may simply overwrite each other’s contributions (Viégas, Wattenberg, Kriss, & Ham 2007). The effective use of wiki technology thus requires some kind of governance processes, mechanisms, and mindsets that ensure that user interactions remain constructive. For open, Internet-based wiki platforms, escalation procedures, such as dispute resolution processes, take effect when users cannot constructively integrate their perspectives or act in destructive ways (Viégas, Wattenberg, Kriss, & Ham 2007)). In the context of enterprise wikis, formal roles will be allocated that oversee and facilitate the content creation process. The other core issue of wiki-based collaboration is that the

content remains in a “state of flux.” Unless somebody actively “freezes” the wiki content, users can continue to add to it, integrate new perspectives, or change the entire essence of the content. While this permanent “state of flux” allows users to constantly update the content, it limits the ability of the wiki to serve as an “authoritative source,” both on the World Wide Web or in the context of an enterprise. While the open principle of wiki technology creates substantial opportunities for new forms of communication and collaboration, it also introduces issues into the organizational communication environment that need to be considered when using wikis for different communication or collaboration processes.

Despite these possible challenges, wiki technology offers a distinct set of characteristics that are increasingly used to support a variety of communication and collaboration processes in organizations. An example of such a wiki-based collaboration is provided by Foremsky (2005), who describes an effort at IBM to promote corporate blogging. In this case, it was found necessary to create clear guidelines so IBM staff would have assurance about the scope of their blogging efforts. Instead of developing these guidelines by corporate lawyers or other small expert groups, all IBM employees were invited to participate in the guideline development for a period of 14 days using a shared wiki. IBM staff who had an interest in blogging started drafting these guidelines and continuously refined the content by adding, deleting, or rephrasing until a set of guidelines had developed where the concerns of all interested parties were integrated. A comparable use of wiki technology to foster staff engagement in strategic issues is provided by Danis and Singer (2008), who describe how wiki technology was used to allow research staff to contribute to the development of the strategic planning objectives of their institutes. In addition to the staff engagement, the strategic planning process was reconceptualized from being an annual exercise to becoming an ongoing distributed effort with the wiki serving as a “living document” enabling these efforts.

The emerging literature on enterprise wikis (e.g., Majchrzak, Wagner, & Yates, 2006; Zammuto, Griffith, & Majchrzak, 2007; Danis & Singer, 2008; Blascke & Stein, 2008; Yates, Wagner, & Majchrzak, 2009) offers a range of further examples explaining the different ways in which wiki technology is applied within the organizational

context. Wikis are used in the organizational innovation process with individual staff integrating product and market information, thereby creating and continuously refining an overview of the market niche in which they operate (Barth, Vilela, Timoszczuk, & Mussoi, 2008). An area where wikis are commonly used is in requirements engineering, where diverse stakeholders with different backgrounds collaboratively identify and clarify the specifications of software applications. Decker, Ras, Rech, Jaubert, and Rieth (2007) describe how wiki technology facilitates the involvement of users in the formulation of systems requirements and can serve as a tool for the ongoing management and documentation of changes in user requirements. Yang, Wu, Koolmanojwong, Brown, and Boehm (2008) describe how wikis can assist, not only in the formulation and documentation of user requirements, but also in the negotiation between users and systems developers. Similarly focusing on software development project teams, Phuwanartnurak (2009) describes how wiki technology helps diverse members in interdisciplinary teams to consecutively integrate their perspective into the overall systems design. It is of particular interest in this case that they not only use the wiki technology to mediate between dispersed team members but also as tool to support face-to-face meetings. Meeting notes would be added into the wiki in real time, ensuring that everybody agreed with these notes at the time. In their survey, Majchrzak et al. (2006) identified a further range of ways wikis are used in a software development context supporting aspects as diverse as technical communication, issue tracking, and internal workflow. Also, other organizational functions have been found to employ wikis for ad hoc collaboration, hashing out ideas, and brainstorming. Further areas of application include general information and knowledge management, such as vacation schedules, personal blogs, and repositories for policies and guidelines. The examples show the diverse ways wikis already support today's organizations.

Theories of Media Choice

In order to systematically describe wiki technologies, we draw on media choice theories as a framework for categorization and comparison with other

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communication media. Media choice theories have been frequently used in communications research (e.g., Sheer & Chen, 2004; Flanagin & Metzger, 2001; El-Shinnawy & Markus, 1998; McGee, 2000) and other research domains (e.g., information systems, human computer interaction) to identify and compare the underlying characteristics of different communication media. These theories focus on two aspects—namely, systematically assessing communication media with regard to their core capabilities, and explaining the fit between communication media and the communication task.

The essential message of media choice theories is that based on their characteristics, different media have different communicative capabilities that, based on their fit with the communication task, result in more or less effective communication. Within media choice theories, communication media are understood as systems or software applications that enable or support communication activities. These theories consider a wide scope of communication media, and their analysis includes not only traditional forms of communication, such as face-to-face conversations (Dennis & Kinney, 1998), but also software applications. Markus (1994), for instance, recognizes electronic mail as a communication *medium* and evaluates its effectiveness for managerial communication by comparing it with phone or face-to-face conversations, while Blaschke and Stein (2008) explicitly refer to wikis as a communication medium. Hence, for the purpose of the present research, we consider wikis as a medium and focus on media richness theory (Daft & Lengel, 1986), theory of media synchronicity (Dennis & Valacich, 1999), and

common ground theory (Clark & Brennan, 1991), since these theories have established a diverse catalogue of media capabilities that allow us to systematically characterize wiki technology and to compare it with other communication media. The different theories and their method of characterizing communication media are briefly reviewed below.

Media Richness Theory

Media richness theory (MRT) was originally introduced by Daft and Lengel (1986) to explain media choices of managers in organizational contexts. MRT focuses on two core premises (Dennis & Kinney, 1998): (1) communication media differ in richness (the ability to change the understanding of information) and (2) performance improves when managers match the richness of the media with the communication task. Building on social presence theory (Short & Christie, 1976), MRT argues that some media, which the theory identifies as *rich*, create a higher social presence that, in turn, facilitates understanding between the individuals involved in the information processing task. Depending on the characteristics of the information processing task, different levels of media richness are required. For example, in the case of ambiguous information, it is advisable to employ rich media, or even face-to-face communication.

Following this theoretical proposition, MRT categorizes communication media with respect to their inherent richness (Daft & Lengel, 1986). Four media capabilities are used to determine the richness of communication media: *multiplicity of cues*, *immediacy of feedback*, *language variety*, and *personal focus* (see Table 1). *Multiplicity of cues* describes the

Table 1. Media Assessment Based on MRT (adapted from Newberry, 2001)

Medium	Multiplicity of cues	Immediacy of feedback	Language variety	Personal focus
Face-to-face	High	High	High	High
Videoconference	Medium	High	Medium	Medium
Email	Low	Low	Medium	Low
Synchronous audio	Low	High	Medium	Medium
Text-based chat	Low	High	Low	Low
Asynchronous audio	Low	Low	Low	Medium

number of ways that information can be communicated through the medium (e.g., text, voice, physical gestures). *Immediacy of feedback* describes the extent to which a medium facilitates rapid responses. *Language variety* refers to the ability of the medium to convey natural language (instead of only numeric information). *Personal focus* describes whether a medium supports the personalization of messages. As an example, email is classified as a relatively lean communication medium due to its low *immediacy of feedback* and low *multiplicity of (communication) cues*.

Several studies have used MRT and the categorization of communication media to explain the choice of communication media and their impact on organizational communication. Recent studies, for example, have focused on the constructs of multiplicity of cues and immediacy of feedback to investigate the impact of computer-mediated communication on decision quality (Kahai & Cooper, 2003), or the mediating role of national culture and message content on the choice of communication media (Sheer & Chen, 2004). While there has been mixed evidence regarding the empirical testing of MRT, this framework for assessing media capabilities has been very influential (Martz & Reddy, 2005).

Theory of Media Synchronicity

The theory of media synchronicity (TMS) provides a different perspective on media choice by focusing on the ability of media to synchronize communication and collaboration processes in groups (Dennis & Valacich, 1999). It extends MRT by arguing that “[the ability of a medium] to change understanding within a time interval is linked not only to its social factors but also to its information processing capabilities” (p. 2). While MRT focuses on the fit between media capabilities and characteristics of the information processing task, TMS focuses on the fit between media capabilities and the underlying communication processes required. These communication processes are characterized as conveyance (an exchange of information), or convergence (the development of shared meaning).

TMS categorizes communication media with regard to three information processing capabilities (*parallelism*, *rehearsability*, *reprocessability*) and two social capabilities (*immediacy of feedback* and *symbol variety*) (Dennis & Valacich, 1999). *Parallelism* describes the number of

simultaneous communication processes that can coexist effectively; *rehearsability* refers to the ability to fine-tune messages before sending; *reprocessability* focuses on the ability to reexamine information after the communication event; *immediacy of feedback* follows its MRT-based equivalent; and *symbol variety* subsumes the multiplicity of cues and language variety of MRT.

Following TMS for most communication scenarios, the convergence process is best supported by a communication medium that offers low feedback and high parallelism to allow group members to autonomously obtain information and independently focus on the deliberation of its meaning. Email provides such capabilities, as indicated in Table 2. The conveyance process is best supported by communication media that enable high immediacy of feedback and low parallelism to allow group members to synchronize their interaction and to integrate their deliberation process. Face-to-face interactions provide such a combination of capabilities.

Numerous studies have drawn on TMS and have used the range of media capabilities to categorize the communication technologies available in today’s organizations. Building on TMS, studies have focused on the use of different communication media for conflict management and other interpersonal communication processes (Maruping & Agarwal, 2004), their role in deceptive communication (Carlson & George, 2004), and how training of virtual teams can mediate the relationship between media choice and mutual understanding and satisfaction among team members (Cornelius & Boos, 2003). Researchers found that TMS often provides an alternative explanation for media choice, which explains some of the inconsistent research findings that have been identified in several MRT-based research studies (DeLuca & Valacich, 2005).

Common Ground Theory

Common ground theory (CGT) (Clark & Brennan, 1991) offers a different perspective of communication and the required media capabilities. It focuses on the use of communication media in the presence or absence of common ground between communication partners. Common ground is established through shared experiences and shared knowledge and also as an interactive process during the communication

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Table 2. Media Assessment Based on TMS (Dennis & Valacich, 1999)

Medium	Immediacy of feedback	Symbol variety	Parallelism	Rehearsability	Reprocessability
Face-to-face	High	High	Low	Low	Low
Videoconference	Medium–High	Medium	Low	Low	Low
Telephone conference	High	Medium	Low	Low	Low
Synchronous instant messaging	Medium–High	Low–Medium	Low–Medium	Medium	Medium–High
Synchronous electronic conferencing	Medium–High	Low–Medium	Low–Medium	Low–Medium	Medium
Asynchronous bulletin board	Low–Medium	Low–Medium	High	High	High
Asynchronous email	Low–Medium	Low–Medium	High	High	High
Written mail	Low	Low–Medium	High	High	High

event. In this respect, grounding can be compared to convergence—the development of shared meaning. While MRT and TMS focus on the fit between media capabilities and information processing tasks or communication processes, CGT focuses on the common ground as enabler of communication, which in turn determines the communication media that can be effectively employed.

Individuals who are initially lacking common ground require a highly interactive medium that allows for the expression and joint negotiation of common ground. To determine the interactive capabilities, communication media are characterized with regard to their *simultaneity*, *sequentiality*, *reviewability*, *co-presence*, *visibility*, *audibility*, *contemporality*, and *revisability*. *Simultaneity* describes the ability to send and receive information at the same time, while *sequentiality* specifies that turns cannot get out of sequence. The other capabilities are equivalent to the ones described in MRT or TMS. *Reviewability* refers to the ability to reexamine information after the communication event (cf. *reprocessability* in TMS); *revisability* refers to the fine-tuning of information before the communication event (cf. *rehearsability* in TMS). *Co-presence*, *visibility*, and *audibility* describe aspects of media richness: *co-presence* refers to face-to-face interactions, while *contemporality* is comparable to immediacy of feedback. Based on this assessment, email technology is not appropriate for

communication in the absence of common ground, as it lacks the other social and interactive media capabilities that support the grounding process (see Table 3).

Unlike MRT and TMS, which have been developed specifically in the context of computer-mediated communication, CGT has its origin in general communication theory. However, the theory has been well adopted by researchers focusing on computer-mediated collaboration, with a range of studies building on its propositions and framework for assessing media capabilities. In a range of studies, the impact of particular media capabilities on achieving common ground has been established (Kraut, Miller, & Siegel, 1996; Convertino, Ganoë, Schafer, Yost, & Carroll, 2005; McCarthy, Miles, & Monk, 1991), while other studies have also found contradicting evidence that yet needs to be consolidated (Birnholtz, Finholt, Horn, & Bae, 2005).

Research and Findings

To better understand the function of enterprise wikis and the position they can fill in organizational communication, we embarked on a research project that systematically identified the media capabilities of wikis and analyzed their role in established media choice theories. We chose the media choice theories outlined

Table 3. Media Assessment Based on CGT (Olson & Olson, 2000)

Medium	Simultaneity	Sequentiality	Reviewability	Co-presence	Visibility	Audibility	Contemporaneity	Revisability
Face-to-face	High	High	Low	High	High	High	High	Low
Telephone	High	High	Low	Low	Low	High	High	Low
Videoconference	High	High	Low	Low	High	High	High	Low
Two-way chat	High	High	High	Low	Low	Low	High	High
Answering machine	Low	Low	High	Low	Low	High	Low	Low
Email	Low	Low	High	Low	Low	Low	Low	High
Letter	Low	Low	High	Low	Low	Low	Low	High

above, as they provide well-established frameworks that offer us a systematic method for assessing and comparing the media capabilities of wiki technology. As wikis have only recently become a popular communication medium, none of the theories (to our knowledge) previously considered, let alone empirically assessed, enterprise wikis. To address this research gap, we opted for a qualitative meta-analysis of case descriptions and publicly available reports on wiki use in organizations. Conducting a meta-analysis is an appropriate and important analytical framework for comparative research on common issues with different but related empirical backgrounds (Mantarazzo & Nijkamp, 1997). It is meaningful for this study context, as it allows us to access a large variety of ways enterprise wikis have been used and allows us to integrate these individual descriptions on a more abstract or theoretical level. By conducting a meta-analysis, we add value to existing case descriptions and reports, as meta-analysis “provides a means for enhancing the contribution of qualitative findings to the development of a more formalized knowledge that is meaningful and useful to the discipline” (Zimmer, 2006, p. 312).

For the purpose of the meta-analysis we focused on publicly available descriptions of enterprise wikis. Relevant publications were identified through academic databases (EBSCOhost, Business Source Complete, IEEE Xplore, SpringerLink, ScienceDirect), Google Scholar, and Google Web search. Our inquiry focused on the following key

words and terms: *wiki*, *enterprise wiki*, *firm wiki*, *corporate wiki*, *workplace wiki*. We excluded generic sales descriptions and product reviews of enterprise wikis. Based on the range of searches conducted, we shortlisted 32 descriptions of enterprise wikis for further analysis. In collecting these descriptions, we deviated from the exploratory approach suggested by Yin (2003), namely to incrementally add cases until no new phenomena are revealed. We instead used a confirmatory approach. Estimating that approximately 1 in 4 descriptions would reveal information about media characteristics, and seeking ideally (on average) 8 confirmatory statements per characteristic determined our target of 32 descriptions. All descriptions of enterprise wikis were prepared between 2001 and 2008 and included 10 case studies, 15 reports, and 7 empirical research studies (short summaries of the contributing publications are provided in Appendix 1).

Our analysis focused on mapping the defining characteristics of enterprise wikis (as provided by the diverse descriptions) against the media capabilities of the three media choice theories. The mapping was guided by the definitions of the media capabilities, and corresponding examples of their application are provided in Appendix 2. We assessed the media capabilities based on insights provided in the descriptions of enterprise wiki use, and at the same time included a comparison with other communication and collaboration media. The media capabilities of enterprise wikis, as identified in the

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analysis, are summarized in Table 4. The table shows our assessments and references to the particular sources that contributed to the assessment. Overlaps between the media capabilities of the different media choice theories are highlighted in the media characteristic column of Table 4. On average, each characteristic was confirmed 7.14 times, which was close to our target of 8 confirmatory references.

Our meta-analysis of the literature on enterprise wikis allowed for an identification of their particular media capabilities. Most capabilities were clearly identified through a minimum of three sources and were considered valid by the raters. Only descriptions concerning the *immediacy of feedback* were found to be lacking a meaningful reference point, as they seemingly overstated the rapid interactions on wiki platforms, even though wikis are by design an asynchronous communication platform. A comparison with other communication media, such as videoconferencing, helped to put the *immediacy of feedback* capability of enterprise wikis into perspective. Two media capabilities (*rehearsability*, *revisability*) did not have sufficient backing from the available literature to provide meaningful insights. In this case, raters drew on their expertise to derive a categorization.

Discussion

The summary in Table 4 identifies wikis as a capable technology for communication and collaboration in organizations where careful (rehearsed and revised) discourse is desirable, and where communication results are repurposed. Two important findings of the capability assessment need to be highlighted and further discussed: the similarities between wikis and email technology, and the opportunity to extend media choice theories by establishing *refactoring* as a new media capability.

Comparing the media capabilities of enterprise wikis with other communication media, a surprising similarity to email technology emerges. Emails and wikis exhibit similar capabilities across most categories, suggesting that they overlap with the niches they occupy within the corporate media landscape: they are asynchronous, lean media that draw their strengths from *rehearsability* and *reprocessability*. Hence, both media assist people in carefully formulating their communication and allow users to thoroughly decode the communication they have received (Olson &

Olson, 2000). The observation that there is an overlap in the media capabilities of email and wiki technology is confirmed by a number of reports describing how wiki adoption has reduced the use of internal emails in organizations (e.g., Suarez, 2008). However, in addition to these similarities, wikis offer a distinct set of advantages for internal communication needs. Email is a client-based technology that distributes multiple, independent copies of identical messages to all receivers, congesting email servers and leading to versioning problems. A wiki, on the other hand, is a server-based technology that allows users to view the same single document, relieving the communication infrastructure of duplicated messages, and counteracting the circulation of multiple versions. This underlying structural difference seems to make the wiki the better choice for a large number of internal communication events in organizations. When interpreted through the lens of media choice theory, the only significant difference between the media capabilities of these two technologies is the ability of email to personalize messages. Based on this ability it can be assumed that emails will remain the media of choice for communication tasks that require personalization. However, only a small fraction of current email messages within organizations require such a personalization (Lynch, 2008), while a large number of messages distribute generic information, which is sometimes ironically referred to as “corporate spam.” For this kind of communication, wiki technology would seem to be ultimately superior to email—once corporate users become sufficiently familiar and comfortable with wiki use.

The analysis has also revealed a shortcoming in the ways current media choice theories categorize media capabilities: they do not consider the *refactoring* of content in their analysis. However, content *refactoring* clearly constitutes an important capability that is unique to wikis: users continuously modify content *after* the initial communication event. This capability is significant, as it turns a discrete text-based communication event into an ongoing communication process that (ideally) incrementally increases the information quality. In order to address this issue, we believe that future media choice studies should include the refactoring capability in their theorizing and media assessment, as it constitutes a capability that has a significant impact on two of the established media choice theories, CGT and TMS.

Table 4. Media Assessment of Wiki Technology

Media Theory	Media Characteristic	Assessment of Wiki Capability	Source
Media Richness Theory (MRT)	Immediacy of feedback Extent to which the wiki provides users with rapid responses	Low–Medium Several cases point to the high speed of wiki-based communication processes. But in comparison to chat-based or face-to-face interactions, wikis do not provide a high immediacy of feedback.	Low: 3, 9, 12, 29 Medium: 2, 13, 20, 23, 25
	Multiplicity of cues Number of ways information is communicated (e.g., text, verbal cues)	Low–Medium Wikis are largely text based but are increasingly integrated with pictures and videos to provide additional communication cues. Still, the multiplicity of cues for information exchange is limited when compared to other tools such as videoconferencing.	Low: 18, 21, 22 Medium: 10, 14, 15, 23, 25, 27, 29, 30
	Language variety Ability to convey natural language	High Wikis allow users to input natural language as well as tables and numbers.	10, 14, 15, 18, 21–23, 25, 27, 29, 30
	Personal focus Extent to which the wiki supports the personalization of communication	Low Wikis are largely a many-to-many communication medium; messages are directed to groups and not to individuals.	8, 20, 23, 25, 29, 31, 32
Theory of Media Synchronicity (TMS)	Symbol variety (Overlap with <i>multiplicity of cues</i> and <i>language variety</i> of MRT)	Low–Medium Wikis are largely text based but are increasingly integrated with pictures and videos to provide additional communication cues. Still, the multiplicity of cues for information exchange is limited when compared to other communication tools such as videoconferencing.	Low: 18, 21, 22 Medium: 10, 14, 15, 23, 25, 27, 29, 30
	Immediacy of feedback (Overlap with <i>immediacy of feedback</i> of MRT)	Low–Medium Several cases point to the high speed of wiki-based communication processes. But in comparison to chat-based or face-to-face interactions, wikis do not provide a high immediacy of feedback.	Low: 3, 9, 12, 29 Medium: 2, 13, 20, 23, 25
	Parallelism Amount of communication processes that can effectively coexist	High Wiki users can collaborate on the same document simultaneously. Wikis provide probably one of the highest levels of parallelism among all communication tools.	6, 7, 12, 16, 20, 23, 28
	Rehearsability Fine-tune messages	High Every editing and posting can be reviewed on the screen before it is submitted to the wiki.	Direct references in literature are lacking
	Reprocessability Ability to reexamine information after the communication event	High Wiki-based content remains a reference point after the initial communication event. Even deleted or modified messages can be reverted to identify previous content.	2, 8, 11, 14, 20, 30

continued

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Media Theory	Media Characteristic	Assessment of Wiki Capability	Source
Common Ground Theory (CGT)	Co-presence, Visibility, Audibility Face-to-face interactions and media richness	Low Wiki users are largely dispersed.	1, 4, 5, 17, 20, 23, 24, 26
	Simultaneity Ability to send and receive information at the same time	High Wiki users who are editing content are simultaneously reviewing changes and other postings.	2, 14, 19, 20, 22, 25, 32
	Contemporality (Overlap with <i>immediacy of feedback</i> of MRT, TMS)	Low–Medium Several cases point to the high speed of wiki-based communication processes. But in comparison to chat-based or face-to-face interactions, wikis do not provide a high immediacy of feedback.	Low: 3, 9, 12, 29 Medium: 2, 13, 20, 23, 25
	Reviewability (Overlap with <i>reprocessability</i> of TMS)	High Wiki-based content remains a reference point. Even deleted or modified messages can be reverted in order to identify previous content.	2, 8, 11, 14, 20, 30
	Revisability (Overlap with <i>rehearsability</i> of TMS)	High Every editing and posting can be reviewed on the screen before it is submitted to the wiki.	Direct references in literature are lacking

The refactoring capability of wikis challenges some of the core assumptions of CGT, which focuses on the development of common ground among communication partners (Clark & Brennan, 1991). CGT stipulates that the development of common ground between communication partners requires rich media, since lean, text-based media does not provide the necessary verbal or nonverbal cues. However, the refactoring capability and the wiki way of collaboration seem to defy this assumption. During the refactoring process, users continually negotiate meaning and assumptions, and the jointly developed content eventually represents the shared knowledge of the participants. Wiki technology thus seems to suggest that an extension to CGT is needed. The refactoring feature must be recognized in its ability to let users develop common ground even though wikis are text-based, lean media and do not convey additional verbal or nonverbal cues.

The refactoring capability also has significant implications for TMS. TMS posits that the communication processes of conveyance and convergence require different sets of technologies, each with a distinct combination of media capabilities.

However, the present analysis suggests that wiki technology is able to successfully support both these communication processes. Convergence, the development of shared meaning, is very well supported through the refactoring capability and the subsequent development of common ground among users. Conveyance, the presentation of information, is supported through rehearsability and reprocessability, which allow users to effectively publish content for a large audience. By effectively supporting both information processing tasks, wikis question some of the core assumptions of TMS and suggest an extension of the theory.

Implications and Conclusion

Enterprise wikis have only recently received attention from research and organizational practice (Kane & Fichman 2009; Wagner & Majchrzak, 2007; Yates et al., 2009). Wikis constitute a new medium that is usable for a variety of communication and collaboration purposes. Thus, in order to better understand the role of wikis in organizations and to differentiate wikis from other

communication and collaboration media, it is necessary to understand wiki capabilities and their impact on organizational communication and collaboration.

Our investigation has created a number of implications for theory and practice. From a theoretical perspective, we have grounded enterprise wikis and their capabilities in established media capability frameworks, and have identified how the unique features of enterprise wikis challenge some of the core theoretical assumptions of these theories. We have identified the refactoring capability as a new media capability that makes the wiki a unique tool that enables new forms of collaboration and communication in organizations. Despite a focus on rigor and objectivity, the methodology adopted for the study has created a number of limitations of the present research. In particular, our study is based on secondary data that also include nonacademic descriptions of enterprise wiki use. Although we cannot ensure the validity of these secondary data, by including a larger number of cases and reports and by focusing on general trends among the diverse descriptions, we assume that the introduced bias is negligible. However, future research could address this limitation by directly investigating enterprise wikis and their particular use in organizations.

Our study has identified that wikis provide a distinct combination of media capabilities that create opportunities for new information technology-based organizational communication and collaboration practices. However, to leverage these opportunities requires a careful implementation and management of these tools that considers the socio-technical issues the implementation of a new information technology creates. In the context of implementing an enterprise wiki, a number of questions must thus be addressed:

For Which Communication and Collaboration Activities Should Wikis Be Used?

Based on their distinct range of capabilities, wikis support a considerable variety of communication activities. The refactoring capability, for instance, enables communication processes usually associated with communication media with a high social presence, such as the processes of negotiation and consolidation (Sullivan, 1995). A good example of this is the

identification of user requirements for the development of new software systems (Decker et al., 2007). In this context the wiki is used as a documentation and negotiation platform that complements the face-to-face communication among business analysts and system users. By continually refactoring the system's scope, business analysts and system users integrate their understanding of the new system until common ground with regard to the system features is reached. The wiki contributes further to the negotiation and consolidation process by the fact that users can thoroughly examine (high reviewability) any modifications to the systems specifications and carefully prepare their responses (high rehearsability).

The same capabilities make wikis equally suitable for supporting the idea generation process: setting up a wiki for hashing out ideas allows users to integrate and build upon each other's ideas (Majchrzak et al., 2006). The distributed nature of the wiki allows users to contribute without being inhibited by the physical presence of other contributors. While the use of emails and discussion boards would provide the same advantages of the geographical distribution, the refactoring capabilities of wikis provide the distinct advantage of encouraging users to build upon and refine each other's ideas. Document creation is another communication task where wikis provide distinct advantages over the common practice of sharing documents by attaching them to emails. The refactoring capability allows users to synchronously or asynchronously work on the same document without the issues of versions control.

In addition to communication activities where wikis offer distinct opportunities, there are other activities where their media capabilities do not offer a distinct advantage over other media. Wikis are very suitable for quickly publishing information to a wider audience, such as providing project updates to stakeholders. By allowing users to rehearse their contribution before posting it and to revisit content over longer periods, wikis provide benefits to organizational communication similar to discussion boards or common intranet sites. Hence, wikis not only provide a distinct set of opportunities for distinct communication tasks but also provide opportunities and forms of use that overlap with other tools commonly encountered in organizations.

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How Should the Content Creation Process be Governed?

Most public wikis rely on peer-based monitoring, and very few formal rules and access rights are put in place to control the content creation process. The content creation process in Wikipedia, for example, is largely governed by fellow editors who spot mistakes and modify content (Viégas, Wattenberg, & McKeon, 2007). Only in cases of considerable disruption are formal governance processes triggered to safeguard the content creation process. Using a wiki in the organizational context requires decisions whether to adopt the open principle and allow every staff to overwrite the existing content, or to impose restrictions and allocate formal roles. Such decisions on the governance of wiki-based interaction need to be based on the particular communication activities as well as on the nature of the content to be created.

Unlike in open wikis where users can rather anonymously modify content, users in an organizational wiki will be logged in, and any kind of editing activity will be associated with a particular author. The risk of users intentionally vandalizing content in an enterprise wiki is very low. It is rather a key concern that the wiki-based content might not be authoritative: a user might have added false content or content that is not in line with larger strategic objectives of the organization. Especially in larger project teams where members are geographically distributed, users might not have enough background information to judge the validity of the wiki content. Therefore, information in the wiki has to be dependable in order to be acted upon. For these kinds of communication activities, some form of approval process is necessary that shows team members that the information in the wiki has been viewed and authorized for further use. Such authorization processes, on the other hand, may stifle users' interaction speed and creativity, which are among the main benefits of wiki technology. For every domain and communication activity, organizations need to weigh the benefits an unrestricted wiki creates in terms of flexibility and creativity against the risks of users accessing and using invalid information.

How Do We Create the Social Dynamic and Enthusiasm Among Staff?

The significant success of Wikipedia and other public platforms is the result of the interest and enthusiasm among users in sharing and creating knowledge artifacts. There is no guarantee that a comparable level of interest and enthusiasm can be created for wikis in an organizational context. The open Internet provides a high level of anonymity that allows users to engage with limited personal consequences. In the context of an enterprise wiki where contributions are linked to user logins, users might not readily engage in such a dynamic refactoring process, as they do not want to expose themselves or fear to be wrong. Users might be hesitant to refactor previously created content, as they might offend the original author. Creating the enthusiasm within organizations that is necessary for changing the established communication and collaboration practices is thus one of the most critical challenges for the establishment of enterprise wikis.

To overcome these kinds of implementation challenges, it is advisable to focus on the use of wikis in small teams where members have established a high level of trust. These environments will help users to gain experience in a relatively sheltered context where mistakes or problems are easily rectified or solved. Once users have gained more experience and can see the benefits of wiki-based communication, they may be more prepared to use wikis in larger or more anonymous teams. Another strategy that has proven very successful in the implementation of wiki technology in organizations is focused on the nomination of wiki champions (Mader, 2008). That is, individual staff across the organization have the role of sharing not only the enthusiasm but also the expertise of wikis. Wiki champions explain the wiki concepts to their colleagues and assist them in the wiki use. The nomination of wiki champions has shown to be a very valuable strategy for overcoming the initial adoption barrier among staff in an organization.

Lessons Learned

Wiki technology provides organizations and their staff with opportunities for new collaboration and communication practices, but in order to leverage these opportunities one has to recognize best-fit applications

of the technology. As this research indicates, wikis are particularly well suited for tasks high on language variety, parallelism, reprocessability, and rehearsability — i.e., the task environment at Motorola's Systems-on-Chip Design Technology, where 60+ collaborators from different nations successfully interact for new product development (see Twiki success stories at <http://twiki.org/cgi-bin/view/Main/TWikiSuccessStoryOfMotorola>). In contrast, the *Los Angeles Times's* "Wikitorial" (Wagner & Majchrzak, 2007), which ignored the medium's low simultaneity, caused contributors to overwrite each other's contribution, among other problems. In the end, that wiki failed after only three days of intensive use. Consequently, a careful implementation and management is required that expressly considers the socio-technical environment in which the technology is used, so as to assure the best fit of task and technology. Organizing a successful implementation and adoption requires specialists who understand the technology as well as the opportunities for communication practice. Individuals charged with the implementation require a specific skill set (Clark & Andersen, 2005; Rainey, Turner, & Dayton, 2005): they need to create enthusiasm about the technological capabilities but at the same time maintain an in-depth interest in the intricacies of communication and the importance of content quality. If this is ignored, users may fall back to the use of alternative media with similar (but lesser) capabilities, simply because of convenience and familiarity. In order to properly establish wikis in the enterprise, it is essential for such perspectives to be represented in the development of a wiki strategy as well as the ongoing management of the wiki platform.

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Appendix 1: Summary of Contributing Publications

#	Short description [publication genre]
1	Auer, Jungmann, and Schönefeld (2007) elaborate on the use of semantic wiki representations and their contribution to the management of an enterprise knowledge base. The study provides several examples of business scenarios in which these semantic representations can add value to organizations. [Research study]
2	Bean and Hott (2005) describe the virtues of wiki technology and provide a number of descriptions on individual uses of wiki technology. The authors systematically compare the advantages and disadvantages of wiki technology. [Report]
3	Black and Kilzer (2008) describe the case of a U.S.-based university library that uses wiki technology (and other Web 2.0 tools) to coordinate diverse stakeholders when undergoing construction. The wiki was used as a reference source for staff, faculty, and the wider community. [Case]
4	Bock and Paxhia (2008) describe the benefits and drawbacks of wikis and other social software tools for supporting organizations. The report compares a range of software products and their capabilities. [Report]
5	Carlin (2007) reports on the use of wikis in organizations. A particular focus is put on the fact that several wiki implementations are grassroots initiatives and not part of a strategic implementation effort. [Report]
6	Cooney (2006) discusses the opportunities and constraints of implementing wikis at a U.S.-based automotive retailer. A focus is put on the use of the wiki for product documentation and for supporting project management. [Case]
7	Corb (2008) describes the use of a wiki within the IT systems administration of a university in the United States. The wiki is primarily used for process documentations, for building a knowledge base, and for collaboratively developing specifications and policies. [Case]
8	Delio (2005) describes the wiki use in a range of companies and compares how particular wiki features add to specific organizational objectives. [Case]
9	Dove and Calleja (2005) describe how wikis are used to coordinate a cross-institutional international science research project. The description focuses on the use of the wiki for depositing and editing information when writing papers or grant proposals, to manage task lists, and to provide a repository for project information. [Case]
10	Ebersbach, Glaser, and Heigl (2008) describe the overall wiki concept and the range of ways wikis can be used in the context of an organization. The report provides detailed steps and guidelines for the implementation and use of wiki technology. [Report]
11	The Gilbane report (2005) outlines the opportunities and drawbacks of using wiki technology in an enterprise context. The report compares the application areas of blogs and wikis and gives practical recommendations for their implementation. [Report]
12	Hasan and Pfaff (2006) investigate the implementation of a wiki technology in an enterprise context. The study focuses on the socio-technical dimension of the implementation effort and outlines the particular challenges encountered. [Research study]
13	Havenstein (2007) describes the use of wikis and other Web 2.0 tools at the U.S. Department of Defense's lead intelligence agency. The study commends these tools and supports the instant need for information and the speed in which statements and conclusions are backed up with comments from other authors. [Case]
14	Havenstein (2008) describes how the CIA uses a wiki platform for staff to share and edit nonclassified information. Wiki technology and the associated wiki processes became vital for workgroups, departmentwide, or agencywide collaboration. [Case]
15	Heck (2005) elaborates on the versatility of the wiki tool. The report focuses on the opportunities for integrating a further range of applications and the flexibility these applications create for the organizational use. [Report]
16	Janssen (2008) describes how a wiki was used to support the organizing of a Java user conference. The wiki was used to extend the content creation to the conference attendees and other interested parties. [Case]

#	Short description [publication genre]
17	Johnson, Clarke, and Herrington (2008) describe the affordances of enterprise wikis and investigate their contributions to supporting research teams. The study applies the community of practice framework (Wenger, 2008) and investigates to which extent this framework can explain the emerging social processes in a wiki environment. [Research study]
18	Kakizawa (2007) elaborates on the features of wiki technology and other Web 2.0 tools. The study compares different products and describes their benefits and drawbacks for enterprise use. [Report]
19	Leshed, Haber, Lau, and Cypher (2007) investigate the different ways wiki technology is used in the context of an organization. The study focuses on identifying how users share their work processes through the use of wiki technology. [Research study]
20	Leuf and Cunningham (2001) describe the benefits wikis and wiki-based collaboration can provide organizations. The descriptions of wiki use cover application areas as diverse as business, research, and project management. [Report]
21	Lio, Fraboni, and Leo (2005) investigate how wiki technology can contribute to the development of a community of practice. A particular focus is put on investigating the user behavior and social dynamics among the wiki users. [Research study]
22	Littlefield (2005) discusses the use of a wiki in the architecture business. The wikis are built around key competence areas and provide open access for adding new insights or instant collaboration. [Report]
23	Mader (2008) reports on the use and implementation of wikis in a variety of organizations and scenarios. The focus of the descriptions is on conveying practical examples of how wikis can add value to the organization and how successful implementations can be supported. [Report]
24	Majchrzak, Wagner, and Yates (2006) investigate the use of wiki technology in organizations. Their focus is on empirically assessing the different ways wikis are used in organizations and determining the contributions this technology can provide. [Research study]
25	O'Leary (2008) describes the functionalities of wiki technology and elaborates on their range of applications in the corporate context. The study systematically compares the benefits and drawbacks of wiki technology for corporate use. [Report]
26	Pereira and Soares (2007) investigate the opportunities wiki technology can provide for the requirements engineering process. The study systematically compares the key features of wikis and traditional content management systems. [Research study]
27	Rowe and Drew (2006) report on the use and contributions of wiki technology and other Web 2.0 tools for the corporate context. The report offers practical recommendations on the implementation of wiki technology in the organization. [Report]
28	Sarrel (2007) describes the case of a U.S.-based media company that uses wiki technology to facilitate the collaborative writing process. The study offers recommendations on the establishment of wiki technology in a corporate context. [Case]
29	Szybalski (2005) describes the concept of wiki technology and the issues of its implementation in the organizational context. The report focuses on comparing the affordances of wikis and blogs and derives conclusions for their particular area of use in the enterprise context. [Report]
30	Thoeny (2005) describes the use of a wiki in a U.S.-based software development company. The company uses its wiki to keep track of the technology schedules, milestones, interdependencies, meeting minutes, code reviews, and general storage space for related documents. Wiki sites are set up for organizationwide purposes as well as information management tools for ad hoc teams. [Case]
31	Udell (2004a) reports on the social dynamics of wiki technology and other Web 2.0 tools in the organizational context. The report describes how the technology can modify the social interaction between staff members and contribute to a better integration among team members. [Report]
32	Udell (2004b) reports on the use of wiki technology in the enterprise context. Several software products are compared, highlighting the particular benefits for the organizational use. [Report]

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Appendix 2: Examples of Mapping Descriptions of Wiki Use to Media Capabilities

Categorization of Media Capabilities of Wiki	Example of Wiki Characterization in the Literature
Low immediacy of feedback (MRT, TMS), low contemporality (CGT)	"The wiki has been set up to enable information and task lists to be deposited and updated. For immediate issues, IM tools are regularly used. The experience of IM is that you know who is available at any particular instance, and it is very quick to send a message and get an immediate reply" (Dove & Calleja, 2005).
Medium multiplicity of cues (MRT), medium symbol variety (TMS)	"The CIA now has users on its top secret, secret and sensitive unclassified networks reading and editing a central wiki that has been enhanced with a YouTube-like video channel, a Flickr-like photo-sharing feature, content tagging, blogs and RSS feeds" (Havenstein, 2008).
High language variety (MRT), high symbol variety (TMS)	"Each group is using [the wiki] in a little bit different way. It can be any combination of: Sharing a project notebook; tracking features, issues, milestones, meeting minutes or release notes; sharing files; listing experts in a field; sharing a glossary of terms; keeping track of test results; keeping track of Balanced Scorecards and more" (Thoeny, 2005).
Low personal focus (MRT)	"Blogs and wikis play opposite roles [...] blogs are based on an individual voice; a blog is sort of a personal broadcasting system. Wikis, because they give people the chance to edit each other's words, are designed to blend many voices. Reading a blog is like listening to a diva sing, reading a wiki is like listening to a symphony" (Delio, 2005).
High parallelism (TMS)	"One of the virtues of a wiki format is that there is a blurred line between authoring and dissemination [...] second something is authored, someone else can edit it [while others can] comment upon those edits" (Havenstein, 2007).
High reprocessability (TMS), high reviewability (CGT)	"The quality control is done maintaining a historic of versions and allowing old versions to be reestablished in case the subsequent version is not considered the best [...] wikis supply an excellent way to annotate evolutions in the projects" (Pereira & Soares, 2007).
Low co-presence, visibility, audibility (CGT)	"Airline team members logged onto the wiki from connections all over the United States to continually post information for use in identifying and resolving issues regarding this newly developed service offerings" (Bean & Hott, 2005).
High simultaneity (CGT)	"Anyone looking at a page who wants to make a contribution simply clicks on 'edit,' adds their comments or attachments to a dialogue box and clicks 'save'" (Littlefield, 2005).

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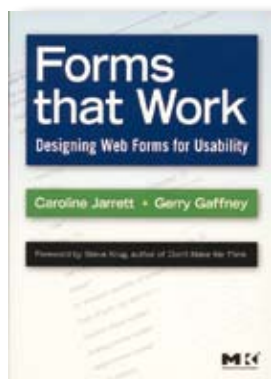
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Opinions expressed by reviewers do not represent the views of the editors or of the Society for Technical Communication.

Forms That Work: Designing Web Forms for Usability

Caroline Jarrett and Gerry Gaffney. 2009. Burlington, MA: Morgan Kaufmann Publishers. [ISBN 978-1-55860-710-1. 199 pages, including index. US\$49.95 (softcover).]



As the authors of *Forms That Work* point out, <form> has been around since the advent of HTML. Whether it is a “shopping cart” at the point of sale or a survey for gathering marketing information, the Web form is an organization’s effort to conduct business. Yet many forms are still not well designed. To address this

persistent issue, usability experts Jarrett and Gaffney take a basic, user-centered design approach, and they manage to do so with passion and enjoyment.

The authors divide the process of creating forms into three parts: relationship, conversation, and appearance. They first address the important stage of establishing a relationship with the form user. This includes branding, rewarding the user (according to social exchange theory), and knowing what questions to ask and when to ask them. They write, “We sometimes see people work their way quite happily through most of a form, only to become annoyed or frustrated by one poorly placed or ill-considered question” (p. 17).

The authors then explore how a form ought to carry a conversation with the user. Much of the book’s guidance is to limit the reasons why users might quit a form. According to Jarrett and Gaffney, the essence of form design is to make it natural for users to understand the question, to find their answer, to judge the correctness of their answer, and to enter their answer into the form. This includes the best uses of the hallmarks of Web forms: type-in boxes, radio buttons, checkboxes, and drop-down lists. These form controls should empower their users so that they can answer accurately, revealing only what they want to disclose.

The authors delve into details of appearance, describing how a Web form should look easy to

complete. For example, with the backing of eye-tracking research, they advise where to put labels and how to align them. According to their experience, neither using title case nor using colons in labeling has any effect on form usability. Taking two pages to discuss them signals that many designers clash over such minutiae.

Jarrett and Gaffney do have limits to their Web form discussions. The book does not address paper forms or digital forms such as fillable PDF files, although much of the advice in the book would apply to these media as well. Also, the book discusses only design. A chapter on technology would have been suitable, since the book touches upon everything else. And the last chapter, a short introduction to usability testing, describes only the essentials of testing. For conducting tests, the authors point to other comprehensive works on the topic in the book’s 10-page annotated bibliography—also interesting reading.

A book about forms could be dry or inscrutable, like many business forms. But Jarrett and Gaffney’s book is designed for easy reading. Each chapter is divided into many sections, with colorful examples, charts, screen shots, and bulleted lists. *Forms That Work* almost suffers from the visual overload the authors warn about. Web readers usually want to skim, but book readers often want just to read. Indeed, the book’s friendly tone, myriad graphics, and brief sections tend to hide its underlying usability research and user-centered design principles. But the visuals and research are positives that will empower designers to create user-centered forms.

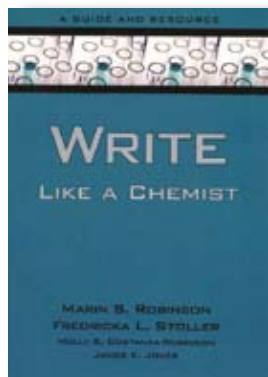
Jarrett and Gaffney’s work is a kind of primer. They assume that their audience has no knowledge of user-centered design, form creation, writing directions, or designing documents. Perhaps they are targeting Web professionals who are skilled in technology but not in communication. Yet even the experienced communicator could benefit from learning user-centered Web form design. Since there are few articles and books on the topic, this fun book is worthy of consideration. Perhaps *Forms That Work* marks the beginning of better practices and deeper research into the usability of the genre of Web forms.

James Morgan

James Morgan has been in nonprofit communications for 14 years.

Write Like a Chemist: A Guide and Resource

Marin S. Robinson, Fredricka L. Stoller, Molly S. Costanza-Robinson, and James K. Jones. 2008. New York, NY: Oxford University Press. [ISBN 978-0-19-530507-4. 698 pages, including index. US\$49.95 (softcover).]



Write Like a Chemist analyzes texts the way a chemist analyzes compounds. Meant to be a textbook for upper-division and graduate chemistry courses and a resource for working chemists, it draws on computer-based analyses of the language of chemistry. It takes you step by step through the entire process

of writing for publication in professional venues and directs your work on your own material, with the assumption that you have writing projects underway.

The book emphasizes four types of professional chemistry literature: journal articles, conference abstracts, scientific posters, and research proposals. Its chapters are grouped into four “modules” based on these types. Two appendixes contain language tips and *move structures*, a term the authors use to describe the common organizational frameworks used in each genre. It isn’t all about words, though. *Write Like a Chemist* also discusses how to handle graphics and shows both schematically and through reproductions how posters should be laid out. Rhetorical moves are shown as diagrams, as well as described in text, for more visually oriented readers. A companion Web site offers supplementary materials for teachers and students.

Robinson and colleagues take a “read-analyze-write” approach (p. vii), in which they provide real-life examples of each kind of writing and then coach you through an analysis of each piece to build an understanding of the conventions of professional writing in chemistry. The accompanying writing assignments use these examples as models for your own writing.

The authors follow established rhetorical theory in advising you to consider the audience and purpose for your writing. They present some useful rhetorical moves, such as scientific writers’ identification of

“gaps” in a body of knowledge into which they can situate their work. They discuss the importance of the “gap statement” in a paper and give examples of gap statements from the literature. You’re then directed to search the literature for yourself to find other examples of such statements and consider their structure, placement, and function in the articles. This method of explanation, example, and follow-up assignments in which readers investigate the topic further is a sound method of instruction.

In another example of the authors’ taking real life into account, they don’t attack the parts of the module on journal articles in the order in which the sections appear in the finished article. Rather, they start with an overview of journal articles, then take you through writing your own methods section, results, discussion, introduction, abstract, and title. They tackle research proposals in much the same way, mimicking the way many people actually write, leaving the difficult parts like introductions for last. For posters, they start with an overview, then do the text, then finally the design.

The authors offer thorough coverage of chemistry writing topics, down to quite specific matters such as whether *data* should be treated as singular or plural (what’s acceptable may depend on the medium). They define key terms and concepts: “The principal investigator (PI) is the main author of a proposal. Additional authors are termed co-principal investigators (co-PIs)” (p. 360). They also provide explanations of scientific terms: “Irradiation (n.) is the act of applying radiation (n.)” (p. 456).

The authors’ own writing is accessible. True, the text is littered with terms such as *internal standard*, *eluant*, and *asymmetric Strecker synthesis* (p. 317), but the chemists and chemistry students who make up the book’s audience will have no trouble with these terms. Chapters open with pithy quotes or statements from the authors on the subjects covered, such as this one from Sharon R. Baker: “Like a picture, a well-crafted graphic is worth a thousand words. (Of course, authors must avoid the temptation to include both the graphic and the thousand words)” (p. 523).

Anyone teaching a college course in professional writing for chemistry students would do well to consider using this thorough, detailed, and systematic book as the textbook. It offers excellent support for students and a solid framework for teachers. Enterprising students who don’t have access to a

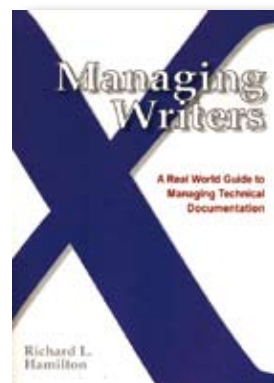
course could profitably use this book on their own, too. Robinson and colleagues have succeeded in producing the “guide and resource” promised in their subtitle for chemists who write—a strong contender for the definitive book in the field.

Marilyn R. P. Morgan

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Managing Writers: A Real World Guide to Managing Technical Documentation

Richard L. Hamilton. 2009. Fort Collins, CO: XML Press. [ISBN 978-0-9822191-0. 266 pages, including glossary, bibliography, and index. US\$24.95 (softcover).]



Richard Hamilton has written an excellent primer for documentation managers, regardless of their experience. Newly minted managers will find *Managing Writers: A Real World Guide to Managing Technical Documentation* to be useful because it provides an overall approach to working with people, along with both

the processes and technologies for creating technical documentation deliverables. More experienced managers will find the book useful as a well-written refresher about the technical communication profession.

In the first section, “Getting Started,” Hamilton discusses the elements of technical writing and the roles of power and influence. The second section, “Managing People,” discusses working with human resources, hiring, motivating, managing change, and employee performance evaluation.

The third section, “Managing Projects,” goes into development methodologies, project planning, project tracking, measurement and metrics, localizing your

documentation, and single sourcing. Finally, Hamilton looks at managing technology, living with technology, acquiring technology, building business cases, XML technology, using the Internet, managing content, and avoiding common pitfalls. He also includes a documentation plan template and glossary.

Hamilton makes clear that the book is intended for anyone (not only managers) involved with technical documentation. As I read it, I found myself nodding in agreement with his descriptions of organizing job interviews and working with project managers and engineers. For experienced writers who are not managers, Hamilton provides insight into the challenges a documentation manager faces.

Of particular interest to me, and I would imagine to many other STC members, is his chapter about building business cases. In today’s economy, it’s not enough simply to do good work—you must be able to show how your work makes or saves money for the organization. The business case chapter provides guidance on considering those questions.

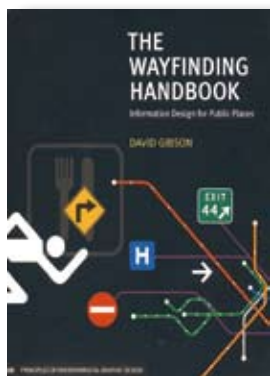
The book is an excellent addition to your professional reading list. It is also an excellent addition for students wishing to learn the realities of the technical communication profession.

George Slaughter

George Slaughter is a senior technical writer with The Integrity Group and a past STC Houston chapter president.

The Wayfinding Handbook: Information Design for Public Places

David Gibson. 2009. New York, NY: Princeton Architectural Press. [ISBN 978-1-56898-769-9. 152 pages, including index. US\$24.95 (softcover).]



With colorful, high-quality illustrations on virtually every page, this primer introduces the discipline of creating wayfinding systems, a discipline also known as signage, sign-system design, architectural graphics, and environmental graphic design. Drawing on his 30 years' experience in this specialized design

profession, author David Gibson explains in a concise, easily readable manner how good wayfinding design enables us to orient ourselves quickly and to feel at ease in unfamiliar surroundings.

The Wayfinding Handbook, written as a guide for students, teachers, professionals, and clients of the wayfinding process, is organized into four color-coded sections: "The Discipline," "Planning Wayfinding Systems," "Wayfinding Design," and "Practical Considerations." Likely to be of most interest to technical communicators are the second section, which explains the design process along with sign categories, content, and locations; and the third section, which explores branding, typography, color, maps, materials, and sustainability.

The section on planning wayfinding systems includes numerous diagrams, circulation maps, and photographs of city models as well as city sights to illustrate the main strategies for organizing wayfinding systems: districts, streets, connections, and landmarks. These strategies are modeled on urban planning but apply to a host of public places, such as transportation networks, museums, shopping malls, and academic campuses. A complex place is divided into zones or districts, which are marked with signs and connected by pathways, such as streets or corridors, that provide a network with landmarks that guide people to important nodes, such as train stations, elevators, stairways, and destination points.

The second section also distinguishes several categories of signs: identification, direction, orientation, and regulation. Gibson explains how each sign, regardless of category, is a "separate voice" serving a particular function and displaying a particular content.

Technical communicators already have a working knowledge of the typography basics and layout design that Gibson provides in the third section. As professional communicators, we also know how to use color as an organizing principle; thus, Gibson's chapter on color may not be particularly enlightening. Even so, his discussion of how color can create a signature identity as well as help people connect emotionally with a setting is worth reading. More likely to be instructive to technical communicators is Gibson's overview of how to create three-dimensional forms and to use materials (for example, metals, glass, and stone) and fabrication processes (for example, cutting, etching, and casting) in wayfinding design.

This book is enriched with several essays designated "Other Voices," in which Gibson's colleagues write on special topics ranging from designing new typefaces to map design. In addition to numerous examples of signs, Gibson includes useful reference tables. A lengthy list of sources, an index, and visually pleasing page layout add to the book's usability.

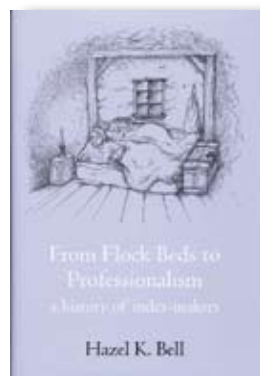
The Wayfinding Handbook offers a most pleasant way to learn about a subspecialty of environmental graphic design.

Nancy MacKenzie

Nancy MacKenzie teaches undergraduate and graduate courses in technical communication at Minnesota State University, Mankato. She is a senior member of STC.

From Flock Beds to Professionalism: A History of Index-Makers

Hazel K. Bell. 2008. New Castle, DE: Oak Knoll Press. [ISBN 978-1-58456-228-3. 333 pages, including index. US\$95.00.]



From Flock Beds to Professionalism: A History of Index-Makers opens with an epigram: “At the laundress’s at the Hole in the Wall in Cursitor’s Alley up three pair of stairs, the author of my Church history, if his flux be over... you may also speak to the gentleman, who lies by him in the flock bed, my index maker. Alexander Pope, Account of... Mr

Edmund Curll, Bookseller (1716).” It is a history of the profession of indexing and the author’s musings on how far the profession has come from the time when indexers literally “got in bed with” their clients. Moreover, the profession is the least part of the history. The book is, as the subtitle states, first and foremost a history of index makers. To that end, it concentrates on indexers themselves, both in general and as personified in 65 biographies of influential indexers who lived and practiced from 1428 to the present.

Hazel K. Bell has been a freelance indexer since 1964, compiled more than 700 indexes, won the Wheatley Medal and the Carey award for indexing, and authored two excellent books on indexing.

Part I of her new book (16 pages) covers the history of indexing, the evolution of methods of practice, training and remuneration, and indexers’ social and personal characteristics. Part II (214 pages) is devoted to individual biographies; and Part III (72 pages) chronicles the banding together of indexers into professional societies, most notably the Society of Indexers (<http://www.indexers.org.uk/>) in the United Kingdom and the American Society for Indexing (ASI, at <http://www.asindexing.org>) in the United States.

The first ancestors of modern indexes date to the 13th century B.C., when Egyptian scribes used red ink to highlight important parts of their papyrus scrolls and Mesopotamians wrote brief descriptions on the containers of their cuneiform tablets.

By the 15th century A.D., the process looked more like what we today know as indexing but was very labor intensive. Indexes were written on slips of paper, which were then laid out and alphabetized on large flat surfaces. When arranged to the indexer’s satisfaction, the slips were placed in order in a storage box for delivery to the printer. A slight fumble resulting in the upending of the box would be a disaster. Indexers made their own indexing slips from scrap paper. They also made their own sorting boards and storage boxes.

By the 19th century standards and practices were developing and were codified in two books by H. P. Wheatley: *What Is an Index...*, and *How to Make an Index*. Unfortunately, the technology of creating indexes had not advanced much in 400 years. Indexers still worked on slips of paper, one entry per slip. The slips were laid out and sorted on tabletops and ultimately pasted onto a larger sheet, which in turn went to the printer. Wheatley cautioned his readers about addressing potential problems: protecting the layout of carefully arranged slips from errant breezes that could destroy days of intensive effort and using a good-quality paste when pasting up the finished product. “Lumps, when you are pasting, are irritating to the last degree” (p. 8).

In the 20th century, index cards finally made the scene, but the process remained much the same. Handwriting evolved into typing, and odd scraps of paper became uniform decks of cards, but there were no real productivity breakthroughs until the advent of computer-assisted indexing in the late part of the century. The years 1981 through 1995 saw the release of the three indexing programs most commonly used by professional indexers: MACREX, CINDEK, and Sky Index.

Though technology has improved over the centuries, it is not apparent that the lot of the indexer has kept pace. The preface describes aspects of an indexer’s world that have changed little:

Indexing is an anonymous profession. An index may be praised or blamed, but rarely is the indexer named, lauded, or shamed. There is no publishing tradition of [naming the indexer].... “the names of indexers are rarely known. From the earliest times to the present day, indexers are little credited. (xiii)

Who, then, are these anonymous, self-effacing scribes who labor so for so little recognition?

Robert Collison in 1954 wrote, “Index-making is only interesting to those people who really like an orderly approach to life.” John Thornton listed in 1965 the “faculties of a born indexer... an orderly mind, infinite patience, and the ability to approach the book from the readers’ angle” (p. 15). G. Norman Knight added to that list: “common sense; also imagination, a general knowledge above the average, a good memory, and an insight into the meaning of the author” (p. 16).

There have been a few sociological studies of indexers in their natural habitat, but none on a large scale. Several surveys done since 1969 characterize indexers as born and not made, fond of detail, empathetic with people, generous of spirit, good communicators, lovers of language, nitpickers, and skillful readers and writers. In 1995, Andrea Frame reported the average age of indexers was 50, with a skew toward the high side. I dare say that the average is now higher, as is the skew.

With that general template in mind, consider the 65 biographies presented in Part II. How many, if any, of the names in Part II are familiar to you will depend, I suspect, on your involvement in indexing. I have been indexing since 1992 and am a past president of the American Society for Indexing, and upon a quick scan of the table of contents, I recognized only 10 of the 65 names as members of the indexing community. Another handful I recognized as historical figures but would not have connected with indexing. No matter. The book is designed such that you need not read it sequentially. Start from the table of contents or the index, or simply open it at random to find interesting bits of indexer lore.

Here’s a fast quiz:

Who is the first known indexer?

What is the world’s longest index?

What role did Samuel Pepys play in the history of indexing?

How did Lewis Carroll, best known for *Alice’s Adventures in Wonderland*, make the list?

And the list goes on. There are far more interesting insights into a niche profession and the

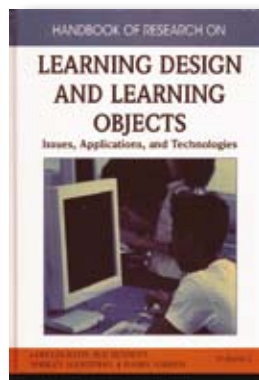
people who made it a profession than one review can possibly cover. The book has content enough to satisfy both the indexing novice and the wizened pro and is well worth reading.

Dick Evans

Dick Evans is owner of Infodex Indexing Services and a freelance indexer. He is a founding member of the American Society for Indexing Carolina chapter and has served as president at both the chapter and national levels.

Handbook of Research on Learning Design and Learning Objects: Issues, Applications, and Technologies

Lori Lockyer, Sue Bennett, Shirley Agostinho, and Barry Harper, eds. 2009. Hershey, PA: Information Science Reference. [ISBN 978-1-59904-861-1. 938 pages, including index. US\$495.00.]



Designed for those involved with e-learning, this two-volume collection of essays examines the challenges and benefits related to the implementation of learning design and learning objects. The editors organize it into three sections: “Learning Design,” “Learning Objects,” and “Integration” and cap each chapter with a list of

key terms. Those who are new to learning designs and learning objects will quickly see several authors highlight one of the chief benefits: reusability. Instead of creating a course or module from scratch, teachers and trainers can consult a wide repository of learning objects or designs. Among technical writers, an easy analogy to this would be single sourcing. Additionally, learning objects and designs represent instances of successful implementation and, therefore (theoretically anyway), instances of best practices.

At its core, this collection aims to understand a conundrum: given the tangible benefits to learning designs and objects, why hasn’t there been wider adoption? Why aren’t more teachers and trainers tapping the strengths of these preexisting models?

Among the many studies presented in this lengthy collection, three dominant concerns emerge: instructional design is reduced to cut-and-paste; repositories don't offer the most user-friendly options for storage or retrieval; and more attention needs to be paid to sustainability, particularly with regard to cost.

Addressing the cut-and-paste concern, several authors theorize that instructors' reluctance to rely on learning repositories stems from the perception that they ignore the contextual diversities intrinsic to every learning environment. Falconer and Littlejohn, for example, outline a four-part framework ("process, granularity, community and characterisation") that more explicitly and deliberately considers local learning dynamics. Similarly, Boyle describes a generative learning object model that presents greater flexibility and customization and, therefore, reusability. Regarding the usability constraints of repositories, Bennett and colleagues identify the paucity of research on how university faculty actually use them and draw from social exchange theory to propose six design guidelines, one of which addresses incentives for participation.

Martin and Eboueya call attention to current repositories' lack of scalability and advocate more of a semantic network model (WebKB-2) that offers more precise search results. On the sustainability front, Bramble and Pachman examine the sticky challenges of securing adequate funding for maintaining the viability of repositories. They describe several funding models, such as a local-to-mixed funding (for example, Wisconsin-Online), national grant funding (for example, National Science Foundation grants to various American universities), and open-source funding (for example, Rice University's Connections).

Overall, this two-volume collection is likely most helpful to those who already have some familiarity with the concerns surrounding learning designs and objects. Yet, given the relative youth of online learning, there is still much work to be done in terms of devising more cohesive, efficient systems for sharing best practices, and this collection represents a significant move forward in that direction.

Phil Tietjen

Phil Tietjen teaches technical and professional writing at the University of New Mexico, where his primary research interests include instructional design, distance education, and virtual

teams. He has taught online courses for more than seven years. He received an M.A. in English from New Mexico State University. He belongs to STC and ATTW.

Script and Scribble: The Rise and Fall of Handwriting

Kitty Burns Florey. 2009. Brooklyn, NY: Melville House Publishing. [ISBN 978-1-933633-67-1. 190 pages. US\$22.95.]



Kitty Burns Florey has penned (pun intended) a book that is part memoir, part history lesson, and utterly charming. Her accessible writing style makes the book's 200 pages fly by. As you read, you'll learn a lot about the history of penmanship and the tools of writing, and a more than a little bit about Florey and her family.

The book's layout complements the subject matter beautifully. The photos and illustrations used throughout add personality and interest to the pages. One spread, for example, includes an elaborate logo from The Spenciarian Saga Workshop, the author's version of her name in Spencerian script, an aside about the book *The Secret of the Skill of Madaras*, and a photo of Florey's college roommate with her portable typewriter, circa 1963. On other pages, the wide gutter showcases more family photos as well as photos of historic figures and script- or scribble-related images such as doodles retrieved from Florey's wastebasket or a photo of a 1951 Olivetti "Scribe" typewriter. Brief comments, also on the gutter, embellish the text.

Script and Scribble takes you through the history of handwriting, the various schools of penmanship (think Spencerian and Palmer), graphology (which tells what your handwriting says about you), and handwriting today, when many of us use a keyboard far more than a pen. Florey ends with a discussion of whether handwriting is important. As you might guess, she concludes that it is and tells us why.

The book contains a bibliography as well as a list of relevant Web sites. The last page is for the

acknowledgments. Florey's comment on the side of this page reads: "The fact that these thank-yous were not written with a fountain pen on monogrammed paper and sent individually by mail does not make them any less heartfelt" (p. 190).

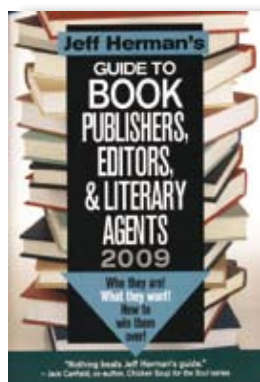
Florey's book is heartfelt. It is a must for anyone who loves the written word, especially the *handwritten* word.

Ginny Hudak-David

Ginny Hudak-David is the associate director in the Office for University Relations, the communications unit of the three-campus University of Illinois system.

Jeff Herman's Guide to Book Publishers, Editors, & Literary Agents 2009: Who They Are! What They Want! How to Win Them Over!

Jeff Herman. 2009. 19th ed. Stockbridge, MA: Three Dog Press. [ISBN 978-0-9772682-4-5. 1,078 pages, including index. US\$29.95 (softcover)].



If you have written the great American novel or a nonfiction book but have not yet shown it to the world, Jeff Herman's *Guide* is for you. Having worked for several decades as a literary agent and author of advice for writers, Herman is well positioned to comment on a wide variety of topics crucial for those who seek publication.

For example, if your goal is to get your work into print with one of the widely known presses, you must understand the publishing conglomerates that own those presses. Herman explains the inner workings of these giants and lists their names, Web sites, mailing addresses, the editors who work there, the types of books they handle, and the successful authors they publish. Then he tells you the bad news: in many instances, only manuscripts submitted by agents are accepted for consideration.

Without an agent, you may turn to independent presses and university presses. There—as with some of the publishers in the conglomerate category—a query letter and self-addressed stamped envelope (SASE) or sometimes an e-mail query is the way you introduce your book to an editor. Here again, Herman provides names, addresses, and the manuscript genres accepted.

The needs of Canadian authors are accommodated in a chapter that covers names, contact information, genres accepted, and the government underwriting of some Canadian presses.

For all the publishers he lists, Herman provides additional key information: the types of submissions that each accepts after responding affirmatively to an initial query. Commonly requested are early chapters or complete manuscripts for fiction and proposals consisting of synopses, sample chapters, and outlines for nonfiction.

While devoting half of his book to publishers, Herman also covers other important topics, including literary agents. He explains the preferred procedure for obtaining a literary agent: write a superior query letter and correspond with each agent exactly as the agent wishes. Details for approaching individual agents are spelled out in the *Guide* and on the agents' Web sites, which Herman lists. Herman also offers tidbits that authors would have difficulty discovering on their own, for instance, which agents prefer e-mail queries, represent nonfiction only, expect movie or television potential, represent debut books, or have traditionally female first names but are actually men.

If you are unable to interest an agent or a publisher in your book, you may decide to self-publish and then distribute your work online via a firm such as Amazon. Herman discusses the merits and demerits of the self-publishing route to sales.

Among the common reasons for failure to obtain an agent or a publisher are weaknesses in fiction of plot and in nonfiction of approach, uniqueness, and market niche. If you believe in your work but it exhibits these or other flaws that make it unplaceable, you may want to hire a book editor/book doctor to upgrade your manuscript. These consultants can help make your manuscript "white-hot" (p. 925), a quality that Herman states is crucial to work submitted in a publishing world where neither literary agents nor publishers' in-house editors have the time to polish manuscripts. He distinguishes legitimate from sham editors, describes

the services offered by editors, and offers a list of recommended independent editors.

A smorgasbord of resources completes the *Guide*. For example, Herman provides a useful glossary of publishing terms and a list of Web sites and blogs focused on the industry; literary agents; publishers; and genres, including poetry, children's books, horror, mystery, westerns, and screenwriting. Several brief chapters by Herman and guest authors offer advice on such topics as time management and dealing with rejection. A particularly impressive chapter that rewards close reading is "The Knockout Nonfiction Book Proposal," which presents a successful, full-length proposal for a book on popular medicine that Herman agented.

The comprehensiveness and timeliness of the *Guide* make it required reading for ambitious, persistent authors. Buy a copy. Mark it up enthusiastically. Follow its advice rigorously. Celebrate your sold manuscript joyously.

Ann Jennings

Ann Jennings is an STC senior member, a professor of English, and coordinator of the Master of Science in Professional Writing and Technical Communication at the University of Houston-Downtown. Her novels and screenplays live in a cardboard box under her sofa. Even Herman's excellent advice cannot rescue some writing.

Design Is the Problem: The Future of Design Must Be Sustainable

Nathan Shedroff. 2009. Brooklyn, NY: Rosenfeld Media. [ISBN 978-1-933820-00-2. 320 pages, including index. US\$36.00 (softcover).]



We live in a world of serious social and environmental challenges, many of them exacerbated by mistakes made by a design culture that too often embraces meaningless and wasteful fads, ignores real costs, and abets such idiocies as "planned obsolescence."

In *Design Is the Problem: The Future of Design Must Be Sustainable*, Nathan Shedroff

examines the tremendous impact—for better or worse—that product design can have on the world. While he enumerates the sins of poor design practice, his main interest is in showing how those who truly embrace sustainable design can not only give us a better world, but also secure a competitive edge and profitability for themselves while doing so.

Nathan Shedroff is chair of the MBA in Design Strategy program at the California College of Arts in San Francisco and editor of the *Dictionary of Sustainable Management* (<http://www.sustainabilitydictionary.com/>).

In this handsomely produced book, Shedroff delivers a tour of the broad field of sustainable design. Starting with a discussion of some basic definitions of *sustainability* and *design*—both of which are more problematic than you might imagine—he moves on to introduce the major approaches, understandings, and frameworks that make up the sustainability landscape. He discusses the advantages and limitations of Life Cycle Analysis, Biomimicry, Social Return on Investment, Cradle to Cradle, The Sustainability Helix, and other theoretical frameworks, as well as the ins and outs of various approaches to achieving, measuring, and promoting sustainability.

While the book is obviously aimed at designers, Shedroff avoids insider jargon and works to make the book accessible to the many nondesigners who still play roles in creating products, services, experiences, events, or environments and who could benefit from knowing more about the current discussion around sustainability.

The core of the book is organized around five major multi-chapter themes: Reduce, Reuse, Recycle, Restore, and Process. To take just one, "Reduce" discusses reducing the amount or kinds of materials or energy that products require to be manufactured, delivered, and used. Within this theme, individual chapters discuss designing for usability, designing to use less material, substituting better or less toxic materials, using local materials and manufacturing to reduce transportation, and so on. A similar approach is taken to flesh out each of the other themes.

Of particular interest are the many case studies and real-world examples of sustainability successes (and a few failures) that are presented in sidebar mini-articles throughout the book.

Shedroff never loses sight of the fact that achieving sustainability is a complex process and that perfect solutions are impossible. In fact, he shows that whether

a particular solution is optimum, or even desirable, often depends on which metrics you choose. But he also shows that the more you become aware of entire systems, the more you are able to make informed sustainable design choices.

The book has a companion Web site and includes an extensive roundup of additional resources, including books, articles, online documents, Web sites, blogs, business resources, and educational programs.

Patrick Lufkin

Patrick Lufkin is an STC associate fellow and is currently chair of the Northern California STC Kenneth M. Gordon Memorial Scholarship and membership manager of the STC Management SIG.

Blogging for Fame and Fortune

Jason R. Rich. 2009. [Newburgh, NY]: Entrepreneur Press. [ISBN 1-59918-342-0. 284 pages, including index. US\$21.95 (softcover).]



Blogs are a popular, inexpensive form of entertainment. *Blogging for Fame and Fortune* addresses starting a blog with the intention of building a large audience, which can be a means to fame or fortune. For Jason Rich, “the term *blog*... includes traditional text-based blogs, photo blogs, audio podcasts, vlogs (video-

based blogs), and webcasts” (p. 1). As a technical communicator, you probably know most of this information. But if you’re brand-new to blogs and are just looking for a starting point, this book could be your Blogging 101 textbook.

The information in the book divides into three major sections: starting a blog, achieving fame and fortune, and lessons learned. Each chapter contains an almost overwhelming amount of tips and warnings, some of which are useful. For example, the chapter about driving traffic to your blog includes how “to add functionality that allows your blog’s visitors to submit your blog entries to Digg” (p. 168). Digg is a Web site where users submit and vote on Web content.

Over half of the book is about starting a blog. You find a review of what you need before you start blogging: the format and the appearance. Rich explains the hardware, software, and blogging services needed to start your blog, as well as creating content, for example in vlogs.

Rich’s specific lessons on gaining fame and fortune really come down to marketing. His suggestions boil down to two actions: tell people about the blog, whether through e-mail or social networks or some other means; and use search engine optimization (SEO), including key words. To use SEO, Rich suggests using the online tutorials available through each search engine.

To show lessons learned, Rich first describes mistakes to avoid, such as “not taking into account how your blog will impact your personal and professional life outside of cyberspace” (p. 204). His final chapters offer interesting interviews with people in the blogging service industry and famous bloggers. The advice from famous bloggers is to work hard, be unique, and have good luck. Perez Hilton says he became famous partly because “I was one of the very first bloggers doing what I was doing” (p. 237).

The book is not perfect. I find the writing repetitive. For example, Chapter 7 includes “Nine Tips for Utilizing SEO to Generate Blog Traffic” (p. 121), and Rich covers SEO again in a later chapter. There are also a fair amount of typos. I recommend skipping directly to the information you want instead of reading the book cover to cover.

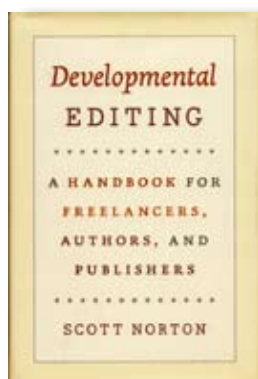
As a current blogger (<http://www.the-jerks.com>), I find most important such marketing ideas as make friends on social networks, update your status when you post, and use SEO.

Angela Boyle

Angela Boyle is a technical writer for Tyler Technologies, Inc, where she has worked for three years. She graduated from the University of Washington with a B.S. in technical communication.

Developmental Editing: A Handbook for Freelancers, Authors, and Publishers

Scott Norton. 2009. Chicago: University of Chicago Press. [ISBN 978-0-226-59514-6. 238 pages, including index. US\$35.00.]



Scott Norton's contribution to the how-to genre wins my nomination for the most focused yet ambitious handbook of the year. This deceptively modest volume contains a treasure trove of knowledge for the reader motivated enough to stick with it. Unlike handbooks that teach process by means of cookbook-style

instructions, *Developmental Editing* offers publishers, editors, and authors much more than a set of rules and exercises. It aims for—and achieves—a much higher goal: a beginner's introduction that manages to cover not just basics and beginnings but also refinements and subtleties of the developmental editor's art and craft.

If you are looking for a book that will teach you the field in a weekend, look elsewhere, but be forewarned that you will probably not find what you seek. When the subject is dense, a fair treatment will have to be appropriately rich and deep to do it justice, and commitment to the material needs to be proportional to its complexity.

Norton's intended audience is freelancers who are already working as developmental editors and also project managers and copyeditors who are transitioning into developmental editing. In addition, he includes material that would be useful to authors who find themselves on the writing end of an author–editor relationship and need some insight into what to expect and how to work productively with the professional who is “mucking around” in their manuscript. A third audience, publishing professionals (production editors, for example), could also find helpful information here, but it is more likely that they will find much of this information either already familiar or too detailed for their purposes.

Developmental Editing is divided into 10 chapters, each covering a major aspect of the editing process:

- “Concept: Shaping the Proposal”
- “Content: Assessing Potential”
- “Thesis: Finding the Hook”
- “Narrative: Tailoring the Timeline”
- “Exposition: Deploying the Argument”
- “Plan: Drafting a Blueprint”
- “Rhythm: Setting the Pace”
- “Transitions: Filling in the Blanks”
- “Style: Training the Voice”
- “Display: Dressing Up the Text”

The back matter includes an afterword addressed to publishers and an excellent annotated list of works for further reading on the subjects of developmental editing, concept and content, narrative, exposition, style, display, and publishing. The volume ends with a well-written and elegant index.

Norton's own hook into the material is the running story of two fictitious developmental editors, Bud Zallis and Hedda Miller, who trained under the same veteran developmental editor. Despite the similarity in training, Bud's and Hedda's approaches to their craft are very different: Bud is the more intuitive and Hedda the more logical, although their roles overlap at times, depending on the project. Each chapter of the book presents a case study of a work in progress. We look over the shoulder of whoever has been hired for the job and see examples of the iterative process that leads to a book's final version. So in Chapter 1, for example, Bud is charged with turning an author's book proposal into a salable project. He has to extract and refine the overabundance of concepts from the author's table of contents into a coherent and logical whole, with the primary emphasis being the marketability of the finished work. Bud has to construct an audience profile and align the book emphasis so that the target audience will connect with the author's thesis, once he is able to identify that thesis.

Hedda, the other developmental editor, faces similar challenges in her chapters as she grapples with manuscripts whose hidden qualities need mining and refining to turn them into marketable works.

Each chapter proceeds with a different project and attacks the building of the work from a different angle. Each case study not only offers a narrative to explain how Bud or Hedda handles the project but also shows before-and-after examples of the changes they make to the outlines, proposals, tables of contents, and so on. We watch as they analyze themes and story lines, organize

threads of ideas and their relationships, draft chapter titles and book titles, analyze supporting arguments, and manage transitions. Throughout the chapters, annotated documents make clear by example how the working developmental editor goes about the process of refining a work in progress into a publishable entity.

In addition to the broad chapter topics, Norton also gives us detailed sidebars that explore related mini-topics such as point of view, how to become a developmental editor, the art of suspense, scene and plot summary, character and setting, and art research.

Although it should be impossible to single out one element from among so many, I have to admit that the chapter that resonates most with my own professional background is the one on style. This chapter includes two elements often seen in handbooks: a table with examples of tonal lapses and a table of rhetorical gestures. They are much more amusing than typical handbook tables, however. The tonal lapse table, divided into categories of “Toward Subject,” “Toward Audience,” and “Toward Self,” lists each type of lapse, provides a definition, and comes up with all its examples based solely on the word *despair*. And the rhetorical gesture table has within every example some use of the term *writer’s block*. I have to think that Norton had fun with these charts as he made up the examples. It certainly made for pleasant reading.

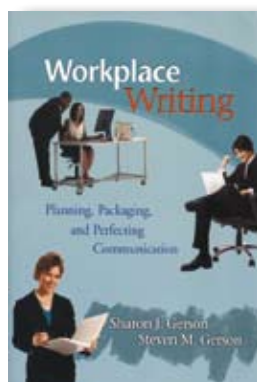
I said earlier that *Developmental Editing* is not light weekend reading and that it is not a typical handbook. To master its content, you will have to commit time and attention to following the process Norton sets forth. With the many before-and-after project examples, you may want to try your hand at working alongside Bud and Hedda as they grapple with the challenges presented by the authors and manuscripts they encounter. According to Norton, “Readers may skip the case studies and, inside of an hour, they’ll have the gist of the entire process” (p. 1). Yes, perhaps. But if you want to learn the richness of what Norton can teach you, read more deeply and devote more time. You will find the effort well rewarded.

Karen Lane

Karen Lane is a freelance technical editor and indexer. She has coauthored a textbook, *Technical Communication: Strategies for College and the Workplace*, and has edited and indexed a wide variety of technical and academic materials. She holds a master’s degree in technical communication and is an associate fellow of STC.

Workplace Writing: Planning, Packaging, and Perfecting Communication

Sharon J. Gerson and Steven M. Gerson. 2010. Upper Saddle River, NJ: Prentice Education, Inc. [ISBN 978-0-13-159969-7. 611 pages, including index. US\$82.40 (softcover).]



In its primary function as a textbook, *Workplace Writing* performs brilliantly. Each chapter incorporates strong instructional strategies: examples, chapter highlights, case studies, individual and team projects, degree-specific assignments, problem-solving activities, Web workshops, and quiz questions. These strategies offer useful

tools for the instructor and engaging educational experiences for the student.

As a resource for nonstudents, especially business writers with minimal experience, this book also performs well. New writers will find it more useful than those with experience, but it provides a good refresher in writing principles and would be a good reference book to have on hand in the office.

The premise behind the authors’ approach to teaching communication is *P³*. This approach consists of three stages—Planning, Packaging, and Perfecting communication. *Workplace Writing* lays out specific steps within each stage and demonstrates how to apply them to create a product that “communicates successfully with its intended audience” (p. xxi).

The process formalized by the authors takes customary (but often overlooked) phases of writing and applies them in a structured manner to workplace communication. These phases involve analyzing goals, audience, and communication channels (Planning); organizing a rough draft and formatting text (Packaging); and editing the product (Perfecting). These principles are used for composing written products and preparing for oral communication.

Examples throughout the book use real-life people in current situations and offer communication challenges to be solved. Readers have the opportunity to come up with their own solutions before going to

the end of the chapter to see how each problem was ultimately resolved.

The authors don't just talk about what to do; they show what to do. Graphics are liberally incorporated to demonstrate the intended product. Authentic writing samples illustrate the document design and formatting recommendations discussed in the chapters, including communication styles, page layout, text formatting, and use of visual aids. Before-and-after visuals demonstrate how communication documents can be improved.

Most letter examples have sidebars that provide insights about tone, elements, and content applicable to that particular letter style. Memos, e-mails, and instant messaging are among the diverse styles represented in these examples. An entire chapter is devoted to visual aids, covering various chart types and discussing drawings and photographs.

The primary intent of the book is to teach how to effectively organize and develop business documents, but it covers grammar, punctuation, mechanics, and spelling in the appendix—complete with examples, of course.

The entire book is a compelling example of *P³* because it clearly was carefully planned and executed. In addition, the design techniques and writing practices discussed in the book are applied to the text of the book.

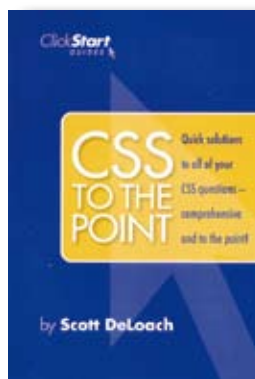
This book would be ideal for business and technical writing educators and for anyone who wants to learn these writing techniques on their own.

Sherry Shadday

Sherry Shadday works for Southwest Research Institute in Utah as a principal instructional specialist developing commercial and government print, stand-up, and Web-based training. An STC member, she retired from the U.S. Air Force as an aircraft electrical systems maintainer and has a technical communication master's degree from Utah State University.

CSS to the Point

Scott DeLoach. 2008. Atlanta, GA: ClickStart, Inc. [ISBN 978-0-615-21213-5. 156 pages, including index. US\$21.00 (softcover).]



CSS to the Point is a reference book for those looking to learn or enhance knowledge about Cascading Style Sheets (CSS). This includes brushing up on CSS skills and discovering new tips and tricks.

This book is organized into an introduction, 12 chapters, and an index. Each chapter includes several

questions and answers with a brief description, visual illustration, and CSS code examples.

DeLoach, a user experience consultant, teaches CSS and JavaScript, and offers practical advice throughout his book on such topics as

- Changing font, font size, text, and colors in headings and paragraphs
- Creating bulleted lists with adjusted spacing and formatting
- Updating color and format of hyperlinks and making a graphical link
- Positioning images and organizing text and images together
- Aligning tables, and specifying settings such as borders, background colors, and rounded corners
- Formatting form elements, including buttons, text areas, checkboxes, and radio buttons
- Using page layout techniques such as padding, floating, and column adjustments

Much of the advice is valuable. Some of the best tips come in the chapters “Print” and “Testing.” “Print” lists practical information for creating style sheets on the printed version of a Web page. Suggestions include how to create a separate style sheet for a printer-friendly page, set page margins, choose fonts, make page breaks, ensure link locations display in the printed page, and remove content on the printed page (such as drop-down menus or advertisements).

Learn the importance of checking Web pages in “Testing.” Advice includes how to view pages in multiple browsers and versions of browsers, what styles are supported in each browser, and how to validate style sheets and make modifications. Be sure to review the chapter “Resources,” which includes information on free online tools, Web sites, and recommended books.

This practical CSS how-to book is one that Web masters and technical writers who develop Web sites would find useful. You don’t necessarily need prior knowledge of CSS, but should be familiar with HTML and basic Web layout and design principles.

While this is a practical resource book, one enhancement would be to include a CD with CSS examples. This would enable readers to copy and paste the code examples from this book and avoid retyping information and possibly making mistakes. The CD could also include Web site links listed in this book.

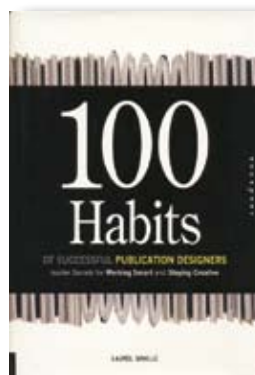
Overall, this book is a good CSS resource that should inspire those familiar with HTML and CSS to take time to brush up on their current knowledge and learn some additional techniques. You can get more information about CSS from DeLoach, including an e-mail newsletter, at <http://www.clickstart.net>.

Angel Belford

Angel Belford is a technical editor/writer with several years of experience. She has published several products, including print and electronic user manuals, Web pages, and quick reference cards. She is a senior member of STC.

100 Habits of Successful Publication Designers: Insider Secrets for Working Smart and Staying Creative

Laurel Saville. 2008. Beverly, MA: Rockport Publishers. [ISBN 978-1-59253-444-9. 192 pages, including index and resources. US\$40.00.]



100 Habits of Successful Publication Designers presents a collection of essays offering critical insights on the design and redesign of magazines, newspapers, literary journals, books, and book covers. The voices of 37 leading designers, art directors, illustrators, design critics, and writers for publications as varied as *The New York Times Magazine*,

Rolling Stone, and *Adbusters* and an array of specialty magazines, journals, and coffee table books provide firsthand knowledge and understanding of the complex art that is publication design.

The contributors, all with extensive experience, explain their creative thinking and design processes and offer advice on reaching creative and strategic goals in designing publications. Students and professional designers have, of course, long had many well-illustrated collections of current and historical designs available as reference tools. The particular strength of this book is that it addresses the question of *why* the designers produced the designs as they did, and what esthetic, editorial, and economic factors were considered in developing them.

In five chapters, the book offers recommendations for planning new magazine designs; redesigning established publications; designing editorial spreads with typography and illustration; working with writers, editors, and illustrators; and designing illustrated books and book covers. Each chapter features a subsection focused on one aspect of the larger issues represented. The last chapter, on the future of print publishing in a digital age, is not as strong as those preceding it. It stresses the influence of the Web, the differences and synergies between the two media, and the incursion of the Internet into the future of print. While there is

news here for beginners, a professional audience will find little new on this topic.

The writers—a range of luminaries and newcomers—include Arem Duplessis, art director of *The New York Times Magazine*; Laurence Ng, founder and designer of *IdN*; Kalle Lasn, founder and designer of *AdBusters*; author and designer Steven Heller; book and book cover designers Carin Goldberg and Vince Frost; and illustrators Anita Kunz and Edel Rodriguez. Indexes of “The Experts” (the essay writers—one occasion where such a term deserves usage) and of the magazines and books illustrated support the logical flow of the book.

The 100 essays, well illustrated by the contributors’ work, are short and to the point, covering a wide range of ideas, basic to advanced, on making well-designed and successful publications that add value for students and professionals alike. The essays offer first-person insights, tips, and tricks on meeting the challenges of cover design, developing concepts and designing publications, working with publishing clients, communicating an author’s intent through design and illustration, understanding the effects of market competition on design, and more.

Essays often offer multiple perspectives in addressing an issue, adding additional depth and some humor to the dialogue. For example, an essay on page design stresses the essential contributions of structure in grids, recurring columns and sections, and the use of style sheets to signal “a cycle that is repetitive and dependable” for mainstream magazines (p. 59). The next essay exclaims “Forget the structure” as a key to developing audiences in niche, literary and youth markets “that expect and embrace change” (p. 61).

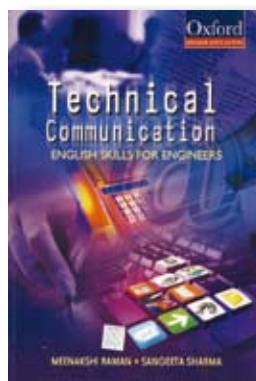
This is a book worth consulting for the wealth of inspiration it provides for developing aesthetically and professionally successful publication designs.

Stephen Goldstein

Stephen Goldstein is a graphic designer in professional practice for more than 20 years as principal of his own design agency. He is an assistant professor of communication media at Fitchburg State College, Fitchburg, MA, and is a contributing writer to *Meggs’ History of Graphic Design* (Wiley, 2005).

Technical Communication: English Skills for Engineers

Meenakshi Raman and Sangeeta Sharma. 2008. New Delhi, India: Oxford University Press. [ISBN 978-0-19-569574-8. 552 pages, including appendixes and index. US\$19.95 (softcover).]



Targeted at the first-year engineering or technical writing student, this comprehensive textbook takes a user-friendly approach organized around typical workplace situations and their impact on communication. The book’s thorough treatment of these topics is complemented by extensive questions and exercises in each chapter for reinforcing the

concepts and skills introduced. As such, the book is compendium of resources usable in different ways for different students and classes. Though tailored to the Indian school system, with a few changes in idiom the book can be usefully adopted in other English-speaking countries.

The text employs boxed chapter summaries, informative section headings, illustrations, sidebar quotes, comparative tables, and humorous but relevant cartoons to organize the copious material in an efficient way. The content not only addresses expected topics—the role of the audience in technical communication, the characteristics of communication in organizations, and the challenges of collaborating and communicating in groups—it also includes a number of helpful insights and techniques, such as how to generate ideas with the “lotus blossom” clustering method; how Claude Shannon’s information theory relates to verbal messaging (how noise—grammatical and other errors—interrupts the coherence or flow of writing); how kinetics (posture, movement) and proxemics (spatial relationships) affect oral presentation; why shorter, crisper sentences are preferred; and why e-mail messages must always be presented professionally.

The resume and interview section outlines and provides examples of the major types of resume and application letters, and offers extensive and practical guidance for handling an interview in person or on the phone. The advice on presentation strategies is also

practical and useful, but the section on creating the slides themselves is limited to three pages. The authors could expand this section to include guidance on the importance of the visual aspects of presentation, such as balancing text and graphics to achieve optimum visual coherence and unity; ensuring a consistent look and feel among slides; and capturing the cause and effect of the underlying argument in the visual design itself.

The book is occasionally marred by mistakes in hyphenation, missing words, and duplicate sentences; a proverb identified as Chinese on one page is re-identified as Japanese on another. The text could use a list of figures, section headings could be numbered for easier access, and the three-page index is useless for a book this comprehensive. These problems may stem from a rushed production schedule, but they deserve the publisher's attention—any technical communication textbook should model in its own presentation the zero-defect standard of correctness and usability expected in a professional setting.

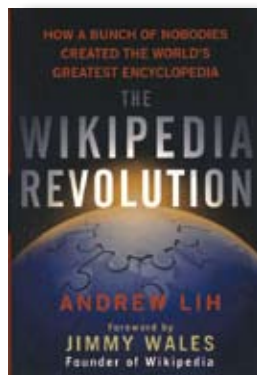
Overall, this is a very thorough introduction to technical writing that would fit flexibly into a first-year engineering or technical writing curriculum. The exercises, worksheets, and writing prompts are varied and complete enough to allow the instructor to customize assignments for a particular class or student. As an introductory textbook, therefore, it provides plenty of material for the instructor to work with, and is certainly worthy of serious consideration for course adoption.

Donald R. Riccomini

Donald R. Riccomini is a member of STC and a lecturer in English at Santa Clara University, where he specializes in teaching engineering and technical communications. He previously spent 23 years in high technology as a technical writer, engineer, and manager in semiconductors, instrumentation, and server development.

The Wikipedia Revolution: How a Bunch of Nobodies Created the World's Greatest Encyclopedia

Andrew Lih. 2009. New York, NY: Hyperion. [ISBN 978-1-4013-0371-6. 272 pages, including index. US\$24.99.]



It is hard to use the Internet today without stumbling across Wikipedia's content. The freely licensed online encyclopedia, first launched in 2001, now includes more than 2.5 million articles in English. Perhaps even more impressive, Wikipedia now encompasses more than 10 million articles across some 200 languages. For anyone

wishing to read the only nonfiction account of the history of the constantly evolving online community, there is now Andrew Lih's *The Wikipedia Revolution: How a Bunch of Nobodies Created the World's Greatest Encyclopedia*.

Lih, a Beijing-based new media researcher and consultant, spent two years researching and writing the book. A Wikipedian himself, Lih hosts the Wikipedia Weekly roundtable podcast, has been an administrator of the English edition since 2004, and has served on the programs committee and as a proceedings editor for the annual Wikimania conferences.

The Wikipedia Revolution is a straightforward, nontechnical narrative. The book traces what enabled the creation of Wikipedia, carefully explaining that while Wikipedia appears to be a radically new phenomenon less than a decade old, it was actually built on a long tradition of a hacker ethos well before the Internet became the commercial success as we know it today.

The book chronicles the history of Netnews, one of the earliest community message systems that ran on a system called Usenet starting in 1979. Lih concludes that the story of Usenet and Netnews is important because "so many things pioneered by Usenet have become foundations for the Wikipedia community and its resulting success" (p. 87). The book also covers DMOZ (short for the site's name on the Internet: directory.mozilla.org), started in 1998 with the idea to create a directory of Internet sites maintained by volunteers.

Lih declares, “It was the project that would give the inspiration for Wikipedia” (p. 23).

One of the things that make *The Wikipedia Revolution* such an engaging read is Lih’s exhaustive coverage of three men: Ward Cunningham, Jimmy Wales, and Larry Singer. Cunningham developed the first wiki (a Web site that uses wiki software, allowing the easy creation and editing of any number of interlinked Web pages). From 2000 to 2003 Wales and Singer worked on Nupedia, a for-profit, peer-reviewed encyclopedia, and then launched its successor, Wikipedia. Wales became Wikipedia’s promoter and spokesman.

Lih ends the book in an original way by setting up a wiki specifically to allow for a compendium of voices to collaboratively write a prognosis for Wikipedia’s future. This is the afterword of the book, and, in the spirit of Wikipedia itself, is published under a Creative Commons license, which allows anyone to freely copy and distribute it. The conclusion? “Wikipedia faces two possibilities: It can remain complacent with what it has achieved, or it can attempt to find innovative ways to remain on the cutting edge of collaborative Internet projects” (pp. 228-229).

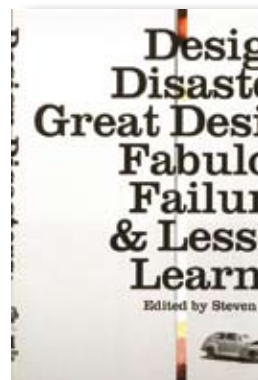
Technical communicators who read *The Wikipedia Revolution* may be inspired to create a wiki to use with work colleagues. A one-stop guide on this topic is Daniel J. Barrett’s *MediaWiki* (O’Reilly Media, 2009).

David Kowalsky

David Kowalsky is a technical writer for NEC Corporation of America. He received a M.A. in East Asian studies from Washington University (St. Louis) and a certificate of technical writing and editing from the University of Washington. He is a senior member of STC’s Puget Sound chapter.

Design Disasters: Great Designers, Fabulous Failures, and Lessons Learned

Steven Heller, ed. 2008. New York, NY: Allworth Press. [ISBN 978-1-58115-652-2]. 215 pages, including index. US\$24.95 (softcover).]



Steven Heller has compiled a book that has as its chief theme the role failure plays in creative design. Tapping 20 talented and successful graphic artists, this compendium has captured in print decades of design wisdom in book that’s easy to pick up and read. To provoke perfectionists to read this book on failure, Heller

chose a unique typography for chapter headings and cover title. The words, set in an oversize yet perfectly readable font, randomly slip and slide across and off the edges of the page.

Readers who have a religious background will understand when I say this book seems like an up-to-date version of the ancient wisdom of Proverbs and Ecclesiastes. Fathers and mothers of graphic design have been willing to document their own failures for the benefit of those sons and daughters following in their footsteps.

For example, Richard Wurman (whose graphic design credits take up one page in the bibliography at the end of the book) states that successful people “understood, tolerated, and even courted failure” (p. 58). While our culture “sustains only the manifestation of success,” in order to get to the bottom of what makes success, “you really do have to fail” (p. 63). The other noteworthy graphic designers in the book also agree that the role of failure is underappreciated. Their common advice is that one should use failure as an insight to what is possible.

Each article also provides glimpses into that contributor’s unique personal experience. We learn what provoked the “aha” moments in their career...the good, the bad, and the ugly success/failure stories.

Having failed in five business ventures myself, I can verify the truth of their words. With each failure I have learned more than I ever knew before. My life motto has become “Care not for it? Use it rather.”

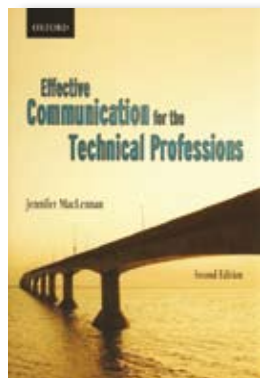
Will this thought-provoking book, full of brief words of encouragement, be of interest to STC's community? I'll let Warren Lehrer's words answer that. Once told by his painting professor not to add words to images, he took this as his mission and has been successfully combining them ever since. So do we technical communicators.

Donna Ford

Donna Ford is current president of the Connecticut STC chapter. She has been a technical writer since 1987 in the hardware, software, and government health care industries.

Effective Communications for the Technical Professions

Jennifer MacLennan. 2009. 2nd ed. Don Mills, ON: Oxford University Press. [ISBN 978-0-19-542547-5. 412 pages, including index. US\$75.00 (softcover).]



Effective Communications for the Technical Professions, by Jennifer MacLennan, is a 10-chapter, four-appendix comprehensive guide to communication success in the workplace. It starts with a broad overview of effective communication and then gradually moves into the specifics of both written and oral communication. The last two chapters focus solely

on communication in the job application and interview process. The appendixes each detail information about a specific topic in communication: case studies, critical reading skills, grammar, and punctuation.

MacLennan outlines the Nine Axioms of Communication early in her book and then weaves these nine axioms through the following chapters. MacLennan states, “all of your communication—not just the communication you do on the job—could be improved by understanding the Nine Axioms of Communication and applying them through the concrete strategies you will learn” (p. 17). These axioms basically state that all communication establishes relationship, precedence, influence, and future expectations for any situation.

Within these overarching principles, MacLennan introduces the seven Cs of professional writing. The seven Cs include completeness, conciseness, clarity, coherence, correctness, courtesy, and credibility. In providing an explanation of the importance for each of the seven Cs, MacLennan provides a reference that she can apply to specific situations and documents later in the book. These editorial concepts are mentioned throughout the chapters that follow.

Organizationally, each chapter is laid out in a similar format. Learning objectives are bulleted on the first page in bold text. Then the main ideas are fleshed out within the body text, and key ideas are pulled out into text boxes. At the end of each chapter is a section that cites a “critical reading” piece for analysis on the topic of the chapter. For example, in the chapter about ethics, the critical reading piece is Tania Smith’s “Three Aims and Evaluation Criteria for Persuasion” and takes up a couple of pages of the total chapter space. For each of these excerpts, the background and credentials of the author are carefully described before the written piece. Each piece contributes a new perspective on the topic of the chapter that supports the previously introduced main ideas. Finally, each chapter ends in a typical textbook format of discussion questions and exercises for student completion.

Overall, the text provides a comprehensive overview of communication for the technical professions, although it seems to be focused mostly on written communication. One chapter is focused on oral reports and presentations and one chapter on the job interview; otherwise, most chapters are concerned with style, mechanics, layout, and appropriateness of a written professional message. For the examples of professional correspondence, formal and informal written reports, and job applications, MacLennan uses the nine axioms of communication and the seven Cs of professional writing, along with outside input of other experts, to illustrate the most effective way to communicate. Overall, this text is a helpful addition to the bookshelf of any professional in the technical world.

Julie Kinyoun

Julie Kinyoun is a freelance writer who also works as an editorial assistant for Arbor Scientia, a division of The Neurosciences Education Institute in Carlsbad, CA.

Detail in Typography: Letters, Letterspacing, Words, Wordspacing, Lines, Linespacing, Columns

Jost Hochuli. 2008. Trans. Charles Whitehouse. London, UK: Hyphen Press. [ISBN 978-0-907259-34-3. 61 pages. US\$25 (softcover).]



Jost Hochuli, a Swiss book designer, teacher, and author, produced this helpful guidebook for writers and editors who need to understand the important differences between two categories under typography: macrotypography and microtypography, with the focus dominantly on the latter.

Specifically, microtypography refers to the important details in set composition (gray matter) on a page. Macrotypography concerns the page layout: type fonts, illustrations, headings, subheadings, images, and borders.

According to Hochuli, the details of gray matter emerged as important to help readers meet legibility needs after French ophthalmologist Émile Javal discovered that when ascenders and upper letters or words in the x-height are exposed and the bottom half covered, the eye recognizes almost every letter or word. This optical discovery, among others, made way for new design processes in typographic presentation, especially the use of fonts and spacing to make print media legible.

Before and after World War I, macrotypography overflowed with many type fonts available to produce a dazzling page layout. Today, novice graphic designers try for fancy aesthetics, yet they have to realize runaway creativity serves little purpose because it defeats the intent of legibility. For an example, this author refers to vivid color management on Web sites with the background being dark purple and the text set in lavender. These two color choices, while personal to the designer, throw away the intent of legibility, the same reason some type fonts developed earlier are forgotten today.

Before considering a design, Hochuli believes graphic designers should ask themselves, “What is this

publication supposed to do for the reader?” When they know, they can produce the product with the right concepts and spend more time dressing the columns of gray matter along with the proper spacing for each component. Ignoring these simple requirements does not bring about legibility, and the reader remembers little of the content. This is caused by saccades (the eyes’ falling back to decipher meaning) or by the lurching in a line that hinders forward progression or interferes with readability. When microtypographic components are in order, the mind is at ease in reading; this is the key benefit of paying attention to the details of gray matter.

Some tips from the book follow:

- Letters—Consistent serif fonts in the body text of books help connect the eyes to text without stress.
- Letterspacing—Kerning can render the correct adjustment for wide or tight spacing between letters.
- Words—It is important to choose a typeface that does not overwhelm the line measure in use.
- Wordspacing—If a ragged right margin is used, words will flow with equal spacing between them. With justified text, holes or vertical rivers result from too much spacing.
- Lines—If you use 11-point type and 13- or 14-point leading in a column, the eyes move from one line to another easily.
- Linespacing—Short or long lines put a strain on readers, so set about 60 to 70 letters per line.

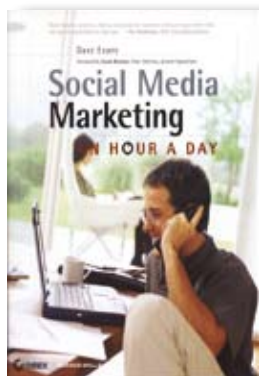
Detail in Typography is an enlightening discussion of how to increase the legibility of your texts. Given today’s heavy reading demands, the ability to quickly absorb and interpret chunks of printed words is of utmost benefit to all readers.

William L. Kidd

William L. Kidd is a retired federal employee, having worked last with the Centers for Medicare and Medicaid Services. As a senior writer-editor, he developed publications that educated beneficiaries about health care benefits and related health issues. His past experience includes managing several newsletters, writing and editing technical documentation, and developing other informational materials.

Social Media Marketing: An Hour a Day

Dave Evans. 2008. Indianapolis, IN: Wiley Publishing. [ISBN 978-0-470-34402-6. 409 pages, including index. US\$29.99 (softcover).]



The Internet has changed how business is conducted, and social media have changed how marketing is conducted online. Businesses wanting to take advantage of the benefits of social media marketing have to take on a whole new mindset that involves building an online social reputation rather than simply aiming ads at consumers. *Social*

Media Marketing: An Hour a Day provides a structured approach to making that mental shift.

Dave Evans has written this book for “marketers wanting to combine social media skills and expertise with their existing, established capabilities” (p. xix). He has honed his own skills as a consultant to organizations such as Microsoft and Southwest Airlines, and his company, Digital Voodoo. Evans’s definition of *social media* (also known as the social Web or Web 2.0) includes social networks (Facebook, LinkedIn), photo and video sharing (Flickr, YouTube), blogs (Lifehacker), conversational communities (Twitter), and wikis (Wikipedia). He provides exercises to complete each day during a three-month period. The goal is to build a social media marketing plan, piece by piece. You do not need experience with social media, or even with marketing, to complete a plan. The early chapters introduce exercises for exploring these media and provide basic marketing guidance. More advanced readers can skip over the basics and still benefit from the daily exercises. Each chapter ends with a summary of points that helps you decide where to jump in.

American consumers are accustomed to being interrupted by advertising. A 30-minute TV show may include 10 to 15 minutes of ads, and these interruptions continue to encroach on Web sites and e-mail inboxes. *Social Media Marketing* focuses on advertising, but not on the kind marketers have practiced. “The emerging role of the individual as a source of content used to inform a purchase

decision is increasing as the role of the marketer and traditional media... diminishes” (p. 14). The book guides readers to the points where, through product reviews, online conversations, and other social interactions, the online customer now learns about a product, and how a business can gain “influence by becoming a respected member in the communities” where these conversations take place (p. xx).

This book is a useful guide to systematically exploring the potential of social media marketing, whether you want to create a marketing plan or merely acquaint yourself with the media. It provides step-by-step instructions, examples of businesses already reaching their customers through this kind of marketing, and plenty of online resources, including a companion Web site at www.socialmediahouraday.com.

Whatever approach you take to the exercises in *Social Media Marketing*, the process can be time consuming. A business would have to decide what resources to devote to it. Evans includes methods for calculating return on investment for social media marketing, but does not offer methods for determining how many customers actually use these new media, which in turn helps determine the portion of a total marketing budget to dedicate to them. This would have been useful information for any business wanting to develop a plan based on this book.

Linda M. Davis

Linda M. Davis is an independent communications practitioner in the Los Angeles area. She holds a master’s degree in communication management and has specialized in strategic communication planning, publication management, writing, and editing for more than 20 years. She is also a member of IABC.

Managing Quality in Qualitative Research

Uwe Flick. 2007. Thousand Oaks, CA: Sage. [ISBN 978-0-7619-4982-4. 156 pages, including index and glossary. US\$29.95 (softcover).]



Technical communicators are frequently hard pressed to provide objective statistical data in support of arguments such as those they make relative to the user interface. In dealing with emotional and opinion responses that are difficult to quantify, the argument must rest on qualitative rather than quantitative research methodology.

The difficulty with qualitative research is that it does not lend itself easily to statistical manipulation and extension to a larger group. Frequently, the number of persons involved is considerably fewer than the number involved in empirical research. The case for the validity of the results of qualitative research rests on the ability of the researcher to demonstrate the quality of those results. That is why Flick's book is important.

This book, part of a series of books called The SAGE Qualitative Research Kit, examines the issue of determining the quality of qualitative research results. In 10 chapters, Flick covers a number of strategies the researcher can use when evaluating the quality of the results. Each chapter begins with a table of contents for the chapter, chapter objectives, and the discussion of the chapter topic, and ends with key points and for further reading.

When researchers invoke ethnographic and other qualitative research methods from social science research, they face the problem of extending the results from the test group to a much larger population. So the central issue becomes one of value: how valuable are the results of qualitative research? Flick's book can prove quite useful to researchers because of his addressing the central issue of ensuring quality in the research results.

Quality, Flick tells us, comes through careful management of diversity in the research process. This diversity includes such things as including and selecting material during sampling, explaining negative cases, and

checking with participants and peers about data analysis. Also, managing diversity extends to preconceived notions the researcher may have.

Using established criteria or even checklists sometimes enhances the quality of the results when used to manage and promote quality rather than to judge it. Further, researchers can use a process called triangulation to validate the results of their process. Triangulation extends the researcher's activities by, for example, using more than one approach to collecting data. Examples include qualitative and quantitative methods, interviews, and observations.

Flick discusses triangulation methods and how researchers can use them to enhance the quality of their processes. He also discusses the ethical implications of qualitative research and provides guidance on keeping the quality issues focused on the process and keeping it transparent.

For those using qualitative research processes to accumulate data in support of assertions, this book offers an overview of how quality can be infused into the process, thereby enhancing the value of the results. Both professional technical communicators and academics will benefit from this book.

Tom Warren

Tom Warren is an STC Fellow, a winner of the Jay R. Gould Award for teaching excellence, and professor emeritus of English (technical writing) at Oklahoma State University, where he established the B.A., M.A., and PhD technical writing programs. Past president of INTECOM, he serves as guest professor at the University of Paderborn, Germany.

Design Meets Disability

Graham Pullin. 2009. Cambridge, MA: MIT Press. [ISBN 978-0-262-16255-5. 342 pages, including index. US\$29.95.]



Design Meets Disability is the type of book that one might find in an art and architecture course, or on a coffee table. It is a fascinating—and important—amalgam of scholarly inquiry, history of design, and, by way of its rich illustrations and photographs, beauty. In the book, Pullin explores the history of designs that modify space,

work, daily activities, personal environment, and even body image itself for the disabled population. But the thesis of his work is much more and leads to an exploration of where such design could take all of us.

Nowhere is this more evident than in his section on one of the two most visible disabled persons in the world today—athlete and model Aimee Mullins (the other being Stephen Hawking, who is also considered). Mullins is a double-leg amputee who pioneered the use of carbon fiber (cheetah) legs in track events, as well as posing for various fashion shoots and starring in movies—replete with prostheses varying from elaborately carved wood to futuristic Plexiglas. She confronts all of us with our preconceptions about athleticism and beauty by observing in her interview with Pullin that “the best thing she can do for people with disabilities is not to be thought of as a person with a disability” (p. 29).

In many ways, therefore, *Design Meets Disability* is an appropriate partner to Ray Kurzweil’s work, particularly *The Age of Intelligent Machines* (MIT Press, 1992) and the *Age of Spiritual Machines* (Penguin, 2000)—both of which explore the merging of human and machine intelligences, for this is an important aspect of Pullin’s work—how the augmentation of one’s person by technology can not only improve the lives of the disabled but also integrate into the nondisabled population, as in the case of eyewear fashion. Consequently, he examines other technologies (hearing, touch, and so on) that might eventually produce fashion artifacts for all, disabled or not.

The book, then, is divided into two related and almost equal components. The first examines the history of design for the disabled from mere functionality to aesthetics. After that, Pullin considers how various well-known designers might approach a variety of functional design problems and incorporate a strong sense of aesthetic while doing so. Some of the results are whimsical, some beautiful, but all thought provoking.

As a result, this is an important book. It certainly is one that human factors engineers should read, but it would be equally at home in academic settings ranging from communication studies to disability studies. It is accessible, as well, and would be easily adapted to both undergraduate and graduate environments. Kurzweil’s premise with regard to disability is that before science learns how to “cure” it, engineers will render it irrelevant. *Design Meets Disability* explores ways that such a future might be realized where form no longer follows function, but is an equal partner to it.

Charles H. Sides

Charles H. Sides directs the internship program for the Department of Communications Media at Fitchburg State College. He has published seven books and more than two dozen articles on technical and professional communication. Executive editor of the *Journal of Technical Writing and Communication*, he also edits Baywood’s technical writing book series. He consults actively.

Designing for the Digital Age: How to Create Human-Centered Products and Services

Kim Goodwin. 2009. Indianapolis, IN: Wiley Publishing, Inc. [ISBN 978-0-470-22910-1. 739 pages, including index. US\$69.99 (softcover).]



The problem with modern consumer and office products is that most are still designed based primarily on marketing or engineering considerations, and only secondarily, if at all, on human needs. This leads to products that are at best uncomfortable and, at worst, actively user hostile.

The solution? Human-centered design. In *Designing for the Digital Age*, Kim Goodwin guides us from initial preparation and developing an understanding of the design context, through research, user modeling, defining product requirements, and developing design frameworks, to finalizing the design details while constantly testing to be sure we got it right. The goal of research is to identify what problems we must solve, greatly reducing the risk of surprises towards the end of the design process, and Goodwin provides a superb overview of the research process—and, for the first time, offers a detailed description of how to create and use personas that integrates details that were scattered through her previous writings and those of her colleagues.

She begins with a telling definition: “Design is the craft of visualizing concrete solutions that serve human needs and goals within certain constraints” (p. 3). The spirit of this quote is honored throughout the book, with an emphasis on ongoing formal and informal communication to ensure that both stakeholder needs and user needs continuously inform the design, yet without ignoring the real-world constraints we all face. Equally refreshing is her repeated reminder that business goals cannot be neglected in any design process. Goodwin emphasizes ongoing collaboration, revealing a clear role for technical communicators; her ideal designer serves as the translator, arbitrator, and negotiator of consensus among the many stakeholders in any design, which is something we do well.

Goodwin’s approach is based on more than a decade of practical experience, and is packed with real-world examples and tips. But theoretical aspects aren’t forgotten, and she cites several key books and research papers. The full design process may be prohibitively detailed and time consuming (potentially many months) for organizations in which design isn’t a recognized priority and when the ship date can’t be delayed just so we can do the job right—a familiar situation for many technical communicators—but she provides shortcuts that let us achieve acceptable results when the full approach isn’t possible. Goodwin concludes with chapters on how to build our own design expertise and gradually create a design-focused corporate culture that will provide more scope for doing the job right.

Her approach emphasizes structured methods that support creativity and ensure we won’t miss anything crucial, and that are never rote methods or straightjackets. She devotes more than half the book

to ensuring that we understand what we’re trying to accomplish and who we’re trying to accomplish it for (the carpenter’s “measure twice, cut once”). Though she provides many examples of successful designs and design principles, her goal is to teach us to discover the best approach for any situation, not to recommend prescriptive and inflexible rules. Frequent exercises encourage us to think through and apply what we’ve learned, but sadly, no sample solutions demonstrate whether we’re on the right path. Copious and detailed examples mostly compensate for that lack.

If you have room for only one more design book, make it this one. The scope and depth of detail are stunning, and the advice is both profound and profoundly practical, showing a subtle and nuanced understanding both of humans and of the corporate environment. (The book itself was designed based on the Goodwin approach, elegantly proving that technical communicators can also use this approach.) Despite occasional lapses into jargon, the book is clearly and elegantly written, and an outstanding contribution to the field.

Geoff Hart

Geoff Hart is an STC fellow and author of the Information Design column in *Intercom*. He has spent many years evangelizing personas and other design best practices.

Rapid Documentation of Policies and Procedures—The Handbook

Juliet M. Kontaxis. 2008. Hackensack, NJ: Benchmark Technologies International Inc. [ISBN 978-0-578-00524-9. 205 pages, including index. US\$30.00 (softcover).]



Rapid Documentation of Policies and Procedures is a welcome addition to the policies and procedures (P&P) bookshelf in that it provides an easy-to-read book with an introductory-level method for developing P&P content rapidly.

Juliet Kontaxis writes in a conversational style suited for novice through mid-level P&P content developers. The book

has five chapters and several appendixes that function as a style guide for how Kontaxis presents content for her clients. The book contains a useful index but no bibliographic references to authoritative sources related to its content.

Kontaxis became involved with P&P in 1997 upon accepting a client's request to develop standardized P&P. She developed her method and book from experiences with P&P projects for her clients, not from the communication profession's research and principles. Hence, her method is experience-based rather than research-based, and her book is a practical rather than an authoritative resource.

Kontaxis indicates two challenges her consulting practice faces: time pressures to finish manuals and limited knowledge of the subject matter for the manuals. She then provides her four golden rules for rapid development of manuals. These rules do not address what many communication professionals would expect and consider as the first commandment (rule) of communication: *Know thy audience*—who are the users and what must the P&P content enable them to perform?

The author's method for developing and presenting P&P content typifies how many consultants and professionals approach a P&P content development project: primarily focusing on subject matter (not performance needs) and applying formats and styles (not procedure presentation techniques).

The author's method includes a typical process to P&P content development that she describes in three stages: design, development, and release. Throughout her process she offers excellent advice, steps, guidelines, examples, and rationales that novices are likely to value.

The author's presentation of P&P content is rooted in the mid-20th century. It uses generic subtitles ("Purpose," "Responsibility," "Procedures," "Requirements"), topic-subtopic numbering (1.0, 1.1, 1.2), single-column page layout, and sections for exhibits and appendixes in a manual. She astutely recommends using process overviews to organize and introduce procedures. In procedural steps, she mixes imperative and indicative moods—a style serious P&P specialists would debate.

The book is weak in clearly defining *process*, *procedure*, and *policy*. It does not address their variations (guidelines, rules, and requirements) or the need for their supporting information. It does not offer procedure-writing techniques beyond the linear procedure (such

as for decision procedures); nor does it advise how to write complex steps effectively. While readers won't be harmed by this method (or the book), they might be left in the dark about additional possibilities for effective and efficient P&P documentation, regardless of how rapidly it's developed.

The unique value proposition of the method and book may succeed in developing P&P documentation rapidly—a noble goal indeed. However, they may be too limited in not offering a more comprehensive set of P&P presentation techniques that are leading edge, research-based, and more performance oriented for today's overwhelmed and demanding P&P information users.

Raymond E. Urgo

Raymond E. Urgo is an internationally recognized expert, educator, author, and leader in policies and procedures communication. His firm, Urgo & Associates (www.urgoconsulting.com), provides consulting services on the development and management of policies and procedures systems and information in organizations, and it publishes the award-winning e-newsletter *The Policies & Procedures Authority*.

Information Architecture: Blueprints for the Web

Christina Wodtke and Austin Govella. 2009. 2nd ed. Berkeley, CA: New Riders. [ISBN: 978-0-321-60080-6. 290 pages, including index. US\$45.00 (softcover).]



Information Architecture: Blueprints for the Web provides an excellent introduction to structuring Web sites—navigation, search, site maps, metadata, facets, tagging, and more.

If you have the 2002 first edition (reviewed in the November 2003 issue of *Technical Communication*), you may still want this new one. Much here is identical to the first edition; but, as Wodtke says, back in 2002 “search wasn’t much help when you were looking for things, and social networks

didn't exist" (p. xvi). Both of these are major topics in the second edition.

This is one of few books where the second edition is shorter than the first. The authors have deleted some of the basic information on usability and user-centered design. They've added a chapter on architecting social spaces and changed most of the examples, including the final "put it all together" case study.

Like most New Riders books today, *Information Architecture* has an open, easy-to-read page layout and many full-color illustrations. The full color is a change from the first edition and contributes substantially to the sense that the book is easier to use and more up to date.

The writing style in this book, as in Wodtke's first edition, is direct, conversational, and clear. For example, Chapter 3 (old Chapter 5), "Sock Drawers and CD Racks—Everything Must Be Organized," discusses the four questions that your visitors ask themselves when they visit a Web page: Am I in the right place? Do they have what I'm looking for? Do they have anything better? What do I do now? For the second of these questions, a key element is to have obvious labels. Wodtke and Govella start off that section by addressing us this way: "Repeat after me, 'A label is not a place to promote your brand. It's a signpost to help people find stuff'" (p. 44).

A book has an architecture just as Web sites do, and making that architecture obvious with foreshadowing lists, clear headings, and good layout is just as important as making a Web site's architecture obvious. Wodtke and Govella do an excellent job with the book's architecture; it's very well-structured and easy to follow.

Some of what they cover is not unique to this book or to information architecture—for example, personas, scenarios, task analysis, and interaction design. Some topics, however, are covered in particularly interesting and useful ways. For example: a table of business models for Web sites, a very easy "just try it" method for card sorting, and their technique of sitepath diagramming.

I found myself disagreeing with them in only one place: in the opening chapter, "First Principles" (Chapter 2 in the first edition), they give eight principles, many of which will sound very familiar to anyone who knows Jakob Nielsen's heuristics.

The last of the eight principles is "Provide contextual help and documentation." The text here

is almost identical to that of the first edition. Their advice is good as far as it goes: "What you can do as a designer is offer the right help at the right moment in the most unobtrusive way possible. Place information in clearly labeled locations, rather than grouping it all under the generic and menacing Help" (p. 18). But why, almost a decade after writing that in the first edition, do they still not suggest that this is a task not for a designer or an information architect but for a team member whose specialty is writing? I wish there were more in the book on interdisciplinary teams and sharing skills.

If you are new to information architecture, you'll do very well to start with Wodtke and Govella's *Information Architecture: Blueprints for the Web*. From there, you may well want to go on to the longer, more detailed, and more formal book by Morville and Rosenfeld (*Information Architecture for the World Wide Web*, 2007; reviewed in the February 2008 issue of *Technical Communication*).

Janice (Ginny) Redish

Janice (Ginny) Redish is president of Redish & Associates in Bethesda, MD. She is an STC Fellow and former member of STC's Board of Directors. Her latest book, *Letting Go of the Words—Writing Web Content That Works* (Morgan Kaufmann / Elsevier, 2007), is still receiving rave reviews.

Review of Five Books on Adobe Illustrator CS4

Louellen S. Coker

Introduction

Adobe Illustrator is often considered one of the most intimidating of the programs in the Creative Suite package because of the plethora of tools, commands, and panels that open up incredible possibilities for the designer. Included in this review are five books by talented graphic designers that will encourage new users to move beyond the fear of a blank document to embrace the exciting capabilities of the industry's standard graphics software while allowing advanced users the opportunity to expand their skill base.

Illustrator CS4 For Dummies

Whether you are a dummy or not, *Illustrator CS4 for Dummies*, by Ted Alspach, is a good addition to your reference library. Aimed at beginners, this *For Dummies* title will get you up and running with Illustrator CS4 almost immediately. Alspach, a graphics guru and prolific author who has written more than 30 books related to graphics, design, and desktop publishing, presents the material in a lighthearted manner that makes this book accessible to even the newest user.

To make the overwhelming possibilities of Illustrator clear, Alspach presents concepts starting from the very basics—opening/creating a document—to working with paths, 3D effects, type, imported graphics, and ultimately production for both print and the Web. Tips, beneficial to newbies and advanced users alike, are scattered effectively throughout the book and are clearly marked. The book's full-color layout, relatively new for this series, as well as the high-quality graphics further enhance the book's usability.

Illustrator CS4 for Dummies presents a discussion about sophisticated software in laypersons' terms and provides information that a beginner might not know and that other manuals gloss over with the assumption their reader has a bit of experience in graphic design.

For example, Alspach not only defines *embedded images* and *linked images*, but goes on to explain when you would use each as well as what you should look for when using them. And while all the books reviewed contain this information, this book is the most in-depth and provides an excellent foundation of how linked and embedded images function. For the reader new to print and online production, the insights shared in these five pages alone will undoubtedly recoup the book's cost in saved production issues during publishing.

I find the pullout quick reference guide in the front to be a little lacking for such complex software. Alspach makes up for this deficit with the two "Part of Tens" chapters (where he provides 10 tips to enhance production and 10 ways to customize Illustrator) and a bonus chapter discussing other effects that is available for download from the publisher's Web site.

Though I often grudgingly purchase a *For Dummies* book (after all, I'm no dummy!), there is no denying that *Illustrator CS4 for Dummies* lives up to the high standards of the *For Dummies* line and does make learning new or expanding skills easier. It will likely be one of the first books you'll pull off your shelf for quick instructions.

Adobe Illustrator CS4 Bible

Adobe Illustrator CS4 Bible is the most extensive of all the books. In its 700 pages (not including its excellent table of contents and index), author Ted Alspach addresses the needs of all levels of users from beginner to advanced. While his approach is much drier here than in his *For Dummies* book, his personality shines throughout the publication.

Truly a bible for Illustrator CS4, the book doesn't leave out much (if anything). As would be expected in any publication of such magnitude, the presentation, though effective, does little to soften the subject. The publisher has used black-and-white printing and has packed in every bit of information possible. The sheer

extent of information included in this book alone makes it worthy of consideration as an addition to your bookshelf.

The layout, though it does adhere to high standards and is consistent throughout, is so tight that nuggets of very important information can easily be overlooked. For example, where Alspach discusses the use of multiple Artboards (a new feature of Illustrator CS4), the lack of color and tight style choices with callouts and headers could cause a reader to overlook the extremely useful capability of overlapping Artboards. As the overlapping of Artboards is not specifically addressed, a user who shies away from experimenting with the tools could quite possibly go for years without stumbling upon this very advantageous capability.

I don't fault the publisher for this particular layout choice, as it allows a depth of information to be included. I do, however, caution the reader to approach the reference in a more studious manner than he or she would other reference manuals. The discussion provides more than step-by-step instruction; it provides deeper discussions of how and why the software works than you will find in other titles. Thus, despite the fact the book is being touted as for beginners, those very new to the software may find themselves a bit overwhelmed with the available possibilities.

While the *Adobe Illustrator CS4 Bible* has been written to progress from beginning to end, most users will pick it up for instruction in a specific area of need. The extensive table of contents and appendix facilitate this approach. And what Alspach left out in the quick reference pullout in his *Adobe Illustrator CS4 for Dummies*, he provides in this book's 25-page appendix of Adobe Illustrator CS4 shortcuts.

Adobe Illustrator CS4 How-Tos: 100 Essential Techniques

Whether you're a new graphics designer or a seasoned expert, David Karlins's *Adobe Illustrator CS4 How-Tos: 100 Essential Techniques* is another excellent resource for your bookshelf. Karlins, who has written several books on digital graphic and interactive design, focuses this book on the features of Illustrator CS4 that designers are most likely to use.

Karlins takes you step by step through 100 techniques that will allow you to master Illustrator

CS4 features. He offers bite-size lessons starting with the basics, then expanding to progressively advanced topics such as drawing lines and shapes; drawing with brushes; editing paths, fills, and strokes; working with layers; creating and formatting text; creating 3D effects; and managing your work flow. In addition to clearly explaining each technique, Karlins provides related tips to further enhance your graphic prowess.

Aiming his content at beginning to intermediate designers, Karlins illustrates each tip effectively with large and clear graphics, allowing you to be well grounded as you apply the steps to your own project. Tips, presented in the margins almost as asides, point out changes from Adobe Illustrator CS3 as well as shortcuts and troubleshooting hints for those times you may have some difficulty employing the tip.

For example, for Tip #50, "Applying Color to Live Paint Strokes and Fills" (pp. 128–129), Karlins paints a full picture of what you need to know to use the technique as he unobtrusively shares

- The change in terminology from CS3 to CS4 ("edges and faces" to "strokes and fills")
- A heads-up that your fill will sometimes flow into nearby faces and how to prevent that by setting your gaps appropriately
- Shortcuts to apply fill attributes to many faces at once
- How to paint edges in a Live Paint group

Another reason *Adobe Illustrator CS4 How-Tos: 100 Essential Techniques* is a great resource is its succinct size. Karlins presents a wealth of information in 233 pages with an easy-to-use layout. Most tips are one or two pages and are presented on facing pages, allowing you to walk through the steps without flipping pages. When the steps cover three or four pages, he breaks them up effectively to prevent confusion as you turn from one page to the next.

Problematic (using that term in its loosest sense) for those who are easily distracted is the logical presentation of the material. I started out just perusing the book, and before I knew it, I had the program open and found myself applying one tip after another to current projects. If I had unlimited time, I could have spent the afternoon working my way through the book with as much enjoyment as I would spend a Saturday afternoon reading a favorite novel.

The only disappointment is the lack of color. But even that is consistent with the title. The essential information is included, and the quality of the graphics, even in grayscale, makes the lack of color less of a distraction. This keeps the production cost down, so that the book is one of the least expensive guides out there.

With all factors combined—content, usability, practicality, price point—*Adobe Illustrator CS4 How-Tos: 100 Essential Techniques* provides a great deal of bang for your buck and is an essential addition to your bookshelf.

Adobe Illustrator CS4 Classroom in a Book

Written and published by Adobe Systems, *Adobe Illustrator CS4 Classroom in a Book* is a bit different from the other books in this review. While the content includes much of the same information as the others, it is presented in a much different manner.

Adobe Illustrator CS4 Classroom in a Book is just as the title implies: a classroom in a book. The content progresses through 15 chapters from one project to the next using increasingly complex techniques. Lessons are broken into 45-minute to 1-hour segments. Quality full-color graphics and a clean layout make this book very accessible.

The context allows you to develop a good understanding of the software while creating real-life projects. You learn the basics in a way that will help you remember what you've learned. The organization that makes it excellent for a classroom setting, however, is not geared to the user seeking more of a quick reference guide/manual.

The CD that accompanies the book provides graphical support for all the lessons included in the book. Disappointingly, additional material about Adobe Press, Adobe Certified, Adobe TV, Community Help, and the Adobe CS4 Resource Center are a little lacking, as they are simply linked PDFs on the related page of the Adobe Web site.

Adobe Illustrator CS4 Classroom in a Book is an excellent reference for students and those seeking Adobe Software Expert certification. If you're seeking an easy-to-use guide for using different aspects of the software, I recommend purchasing one of the other titles in this review.

Adobe Illustrator CS4 on Demand

Published by Que, Steve Johnson's *Adobe Illustrator CS4 on Demand* takes you through more than 500 essential tasks step by step in 425 full-color pages. Johnson has been in the graphic industry and has written 45 books on varying topics since 1991, and his wealth of knowledge is apparent in the book.

The format is conducive to finding answers quickly. The full-color format, complete with crisp graphics, combines with easy-to-follow instructions to make this book a nice addition to your bookshelf. The book is designed to allow the user to come and go as needed, with each task on no more than two facing pages.

Slightly different from others in this review, this book is a compilation of quick references for discrete tasks aimed at beginning to intermediate designers and, as such, hits a different learning style. Johnson provides additional information and time-saving tips alongside the tasks. New aspects of the software are clearly noted in the table of contents and within the tasks. Should you be seeking Adobe Certified Expert (ACE) status, you'll appreciate the linking of each task to its corresponding Illustrator CS4 ACE exam objective.

Well-organized with real-world examples and workshops, the book describes how Adobe Illustrator works with other Adobe products as well as Web and mobile devices. In addition to the information contained in the book itself, you have access to more resources online: additional content, new content, keyboard shortcuts, and new tasks possible with Adobe Illustrator CS4.

For budgets allowing the purchase of only one book, Johnson's *Adobe Illustrator CS4 on Demand* may be the best option, as it offers the broadest coverage of information for all levels of Illustrator CS4 users.

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About the Author

Louellen S. Coker has more than 15 years of experience in public relations, instructional design, Web design, technical writing, and editing. With a masters in technical communication, she is president of Content Solutions, an STC senior member, and a past Lone Star Community president. She has taught technical communication and presented workshops.

Table 1. Books on Adobe Illustrator CS4 Compared

	Illustrator CS4 for Dummies	Adobe Illustrator CS4 Bible	Adobe Illustrator CS4 How-Tos: 100 Essential Techniques	Adobe Illustrator CS4 Classroom in a Book	Adobe Illustrator CS4 on Demand
Audience	Novice	(Advanced) Beginner to Advanced	Beginner to Advanced	Novice to Beginner	Novice to Intermediate
Major Strengths	<ul style="list-style-type: none"> Engaging look and feel Focuses on learning basic skills Provides new users with fundamental production industry information Full color adds to accessibility of the book 	<ul style="list-style-type: none"> Covers Illustrator CS4 extensively Offers an extensive and usable table of contents and index Provides a 25-page appendix of shortcuts Fully explains how and why the software works Offers trouble-shooting hints and solutions 	<ul style="list-style-type: none"> Discrete lessons progress from basic through advanced skills Provides tips associated with each technique to enhance your skill and proficiency Clearly indicates differences between Illustrator CS3 and CS4 Presentation is engaging and invites the reader to apply the techniques 	<ul style="list-style-type: none"> Teaches basic skills in a contextual format Skills are presented in 45-minute to one-hour segments Graphic materials are provided for each lesson Excellent for use in a classroom setting Good for those seeking ACE certification 	<ul style="list-style-type: none"> Covers basic skills Quick reference format that is easy to orient oneself with Easy to navigate Color format and layout choices make the book easy to use Great resource for those seeking ACE certification

continued

	Illustrator CS4 for Dummies	Adobe Illustrator CS4 Bible	Adobe Illustrator CS4 How-Tos: 100 Essential Techniques	Adobe Illustrator CS4 Classroom in a Book	Adobe Illustrator CS4 on Demand
Major Weaknesses	<ul style="list-style-type: none"> Varied graphics rather than themes can leave new users ignorant of how a project progresses from one stage to the next Pull-out quick reference is very weak and does not provide more than just the basic shortcuts that you would use in any software 	<ul style="list-style-type: none"> Presentation of material is so tight that it is easy to overlook valuable information Grayscale images are not as effective for illustrating capabilities such as gradient blends and masks 	<ul style="list-style-type: none"> Covers only 100 of the cool things you can do with Illustrator CS4 Provides essential information regarding each technique, leaving novice users to fend for themselves in some areas Color graphics would make this book complete 	<ul style="list-style-type: none"> Not very usable for users needing information in a quick-reference or manual format Information on the CD about Adobe offerings provided as PDF links to the Adobe Web sites are not worth taking the time to open as you could open a browser and enter the URL more quickly 	<ul style="list-style-type: none"> Quick reference format is enough different from typical reference manual that some readers may have difficulty orienting themselves to the material (in other words, users with some learning styles will have to think about what they're reading)
Comments	Good value for beginning Illustrator CS4 users who want to learn the basics quickly. Intermediate and advanced tips help them enjoy tweaking their skills.	A good book to have at your fingertips when other references don't provide as in-depth coverage of a topic or don't show you how to address a particular issue. Very novice users may find this title intimidating.	Good reference for all users (except possibly for extremely advanced users who have followed this series for several generations). A must-have for anyone using Illustrator CS4, particularly those who have a basic understanding of the software and are seeking to take their skills to a more advanced level.	Good for classroom learners and those studying for ASE certification. Everyday users working with this price point as their budget might do better to pair How-tos with either Dummies or On demand.	The most general of the five books, and as such will meet the varied needs of the average reader. For novice to newly intermediate users whose budget allows for only one book, this is the best choice.
Rating (5-star scale)	****	****	*****	**	****
Cost (USD)	\$29.99	\$44.99	\$24.99	\$54.99	\$29.99

The following articles on technical communication have appeared recently in other journals. The abstracts are prepared by volunteer journal monitors. When the abstracts published with articles are used, they are enclosed in quotation marks. If you would like to contribute, contact Sherry Southard at southards@ecu.edu.

"Recent and Relevant" does not supply copies of cited articles. However, most publishers supply reprints, tear sheets, or copies at nominal cost. Lists of publishers' addresses, covering nearly all the articles we have cited, appear in Ulrich's International Periodicals Directory.

Communication

The central role of communication in developing trust and its effect on employee involvement

Thomas, G. F., Zolin, R., & Hartman, J. L. (2009). *Journal of Business Communication*, 46, 287–310.

"Communication plays an important role in the development of trust within an organization. While a number of researchers have studied the relationship of trust and communication, little is known about the specific linkages among quality of information, quantity of information, openness, trust, and outcomes such as employee involvement. This study tests these relationships using communication audit data from 218 employees in the oil industry. Using mediation analysis and structural equation modeling, we found that quality of information predicted trust of one's coworkers and supervisors, while adequacy of information predicted one's trust of top management. Trust of coworkers, supervisors, and top management influenced perceptions of organizational openness, which in turn influenced employees' ratings of their own level of involvement in the organization's goals. This study suggests that the relationship between communication and trust is complex, and that simple strategies focusing on either quality or quantity of information may be ineffective for dealing with all members in an organization."

Joseph A. Dawson

CEOs' hybrid speeches: Business communication staples

Thro, A.B. (2009). *Journal of Business Communication*, 46, 335–361.

"Closely examining a number of contemporary speeches given by CEOs, this study highlights differentiating features of two business speech genres that together account for a large number of corporate speeches. These genres, which are exemplified by speeches given at events such as industry conferences or company ceremonies, are unlike other business speech genres in that they pursue two main communication ends at once. They take on an assignment set by the speaking occasion while simultaneously pursuing the speaker's commercial objective. CEO speakers construct the hybrid speeches of these two genres by drawing on and modifying single-purpose speech types regularly used today both in business and in other sectors. Recognizing the dual communication purpose of hybrid speeches is critical for understanding their unusual structures and for developing appropriate standards to evaluate them."

Joseph A. Dawson

A descriptive account of the investor relations profession: A national study

Laskin, A. V. (2009). *Journal of Business Communication*, 46, 208–233.

"Despite being a practice of vital importance for corporations, investor relations commands little attention in scholarly research. The studies of investor relations from a strategic communication standpoint are almost nonexistent in the United States. At the same time, investor relations today is undergoing a major shift from financial reporting to building and

maintaining relationships with shareholders. The article reviews literature to define the current body of knowledge and state of research in investor relations. Then, the article reports on a survey of Fortune 500 companies to identify major investor relations practices at corporations: investor relations activities, their target audiences, their place in organizational structure, the education of investor relations officers, and what problems investor relations officers face.”

Joseph A. Dawson

**Obfuscating the obvious:
Miscommunication issues in the
interpretation of common terms**

Brewer E. C., & Holmes, T. L. (2009). *Journal of Business Communication*, 46, 480–496.

“We communicate via many forms every day. When what we say or write is misunderstood, the fault may lie with either party. One source of miscommunication is the different meaning people place on commonly used words and phrases. In this article, the authors report preliminary results from a study on such miscommunication and lay out an agenda for research on improving business communication based on the Integrative Model of Levels of Analysis of ‘Miscommunication,’ developed by Coupland, Wiemann, and Giles.”

Joseph A. Dawson

**Performing sustainable development
through eco-collaboration: The ricelands
habitat partnership**

Livesey, S. M., Hartman, C. L., Stafford, E. R., & Shearer, M. (2009). *Journal of Business Communication*, 46, 423–454.

“‘Performativity’ theory offers a useful framework for illuminating the role that organizational discourse plays in engendering new social imaginaries. In this article, the authors demonstrate this point through a genealogy and textual analysis of the Ricelands Habitat Partnership (RHP), an eco-collaboration between the rice industry and environmental advocates in California’s Sacramento Valley. Articulated here as a story of enemies becoming friends, the RHP gives life to a vision of more (if not perfectly) sustainable

agriculture, where sustaining business and the natural environment can go hand in hand. The authors argue that sustainable development (like democracy or other abstract concepts) becomes ‘real’ for businesses and for society at large through local enactment. That is, new understandings and practices of sustainability are brought into being and institutionalized through the stories that they generate. Attention to the performative effects of language points to the ethical dimensions of our own research and writing. It suggests the need to consider the potentially world-changing effects of stories that we choose to tell.”

Joseph A. Dawson

Education

**Adding value for students and faculty
with a master’s degree in professional
writing**

Hunter, S. M., Giddens, E. J., & Walters, M. B. (2009). *College Composition and Communication*, 61(1), W153–W174. [available in “The Extended CCC” at <http://www.ncte.org/cccc/ccc/>]

“This article describes an interdisciplinary professional writing program and its benefits for students (in terms of knowledge, habits of mind, and developing careers). The authors present qualitative research findings about habits of mind and knowledge domains of successful students, which may prove valuable for faculty teaching in similar programs as they consider curriculum design, or for faculty pondering issues of career development for master’s degree graduates.”

Brent Henze

**Applying digital storytelling technology
to a problem of practice in education**

Wyss, R. (2009). *Essential Teacher*, 6(2), 37–39.

An instructor of English in South Korea introduced digital storytelling to help students overcome their inhibition about speaking English and view their peers as partners rather than as competitors when they recorded each other’s stories. Digital storytelling

offers the students a low-risk avenue to introducing themselves and building rapport with peers in the English as a foreign language (EFL) classroom.

Lee S. Tesdell

Boundary negotiations: Electronic environments as interface

Carpenter, R. (2009). *Computers & Composition*, 26, 138–148.

“Boundaries have long been a concern of literacy scholars, who are very much interested in how individuals cross boundaries and gain membership/genre expertise in new activity systems. Consequently, much attention and research has focused on issues of transition and transference: entering the academic community and acquiring academic literacy, writing across the disciplines, moving from undergraduate to graduate school, or transitioning from school to workplace settings. Less attention has been paid to boundary interactions involving other activity systems, especially those associated with home and popular culture. Drawing upon genre theory, I explore how the popular discourses and literacy practices prevalent in today’s media-savvy, image-literate culture intersect and interact with academic discourses and literacy practices in electronic environments. Understanding how popular culture and classroom genres intersect via the interface of technology can help students use what they already know (i.e., apply the various literacy skills they already practice) in learning new strategies and new conceptions—in short, new literacies.”

Daniel Drahnak

Collaborative dialogue between Thai EFL learners during self-access computer activities

McDonough, K., & Sunitham, W. (2009). *TESOL Quarterly*, 43, 231–254.

“Previous studies have shown that second language (L2) learners use language to reflect on language form when they carry out collaborative classroom-based activities, and that they generally remember the language forms that they had discussed. The current study similarly investigated whether learners reflect on and remember language forms, but focused on

learners’ interaction during self-access computer activities The results indicated that the learners’ LREs [language-related episodes] involved lexical items more often than grammatical forms, and that they successfully resolved the majority of their LREs while they were collaborating. However, their test performance indicated that they only remembered less than half of the lexical items and one third of the grammatical forms that they had discussed. Suggestions are offered for teachers and administrators interested in integrating collaborative self-access computer activities into English L2 courses.”

Lee S. Tesdell

The first weeklong technical writers’ institute and its impact

Whitburn, M. (2009). *Journal of Business and Technical Communication*, 23, 428–447.

“Rensselaer’s Technical Writers’ Institute, the first program of its kind, had a profound impact on technical communication. It enabled technical communicators without formal education in the field to gain important knowledge, provided a forum for communicators from different industries to meet in order to solve mutual problems, played a key role in defining the field and its needs, encouraged recruitment (including the hiring of more women), promoted professional societies and formal degree programs, and seriously affected industry training programs by enabling them to use institute teaching materials. Knowledge gained through the Technical Writers’ Institute enabled Rensselaer to develop many other innovations.”

Kimberly C. Harper

How technical communication textbooks fail engineering students

Wolfe, J. (2009). *Technical Communication Quarterly*, 18, 351–375.

“Twelve currently popular technical communication textbooks are analyzed for their treatment and discussions of the types of writing that engineers produce. The analysis reveals a persistent bias toward humanities-based styles and genres and a failure to address the forms of argument and evidence that our science and engineering

students most need to master to succeed as rhetoricians in their fields. The essay ends with recommendations and calls upon instructors to reenvision the service course in technical communication.”

Kimberly C. Harper

The interlanguage grammar of information management in L1 and L2 developing writing

Kenkel, J., & Yates, R. (2009). *Written Communication*, 26, 392–416.

“Applying concepts from second language acquisition research to developing writing, we explore the commonalities of L1 and L2 writers on the specific level of linguistic choices needed to order information within and across sentence boundaries. We propose that many of the kinds of constructions in L1 and L2 writing most difficult to categorize, labeled as errors, are in structures that are, from the writers’ perspective, principled attempts to meet their obligation of managing information.”

Tim Hadley

Learner-created lexical databases using web-based source material

Friedman, G. L., (2009). *ELT Journal*, 63, 126–136.

“The use of authentic text has been argued to increase learner awareness of lexical form, function, and meaning The Web provides ready-made material and tools for both learner-centered reading and vocabulary tasks. This study reports on the results of a project in which Japanese university EFL students made use of the Web as a living corpus to investigate the specific contexts and collocative properties of lexis. Using an online database, students created a communal dictionary composed of lexis and example sentences culled from Web sources, along with examples of their own devising. The language database was then used to facilitate peer teaching of lexis. Work produced indicates that learners paid attention to lexical form, function, and meaning when composing.”

Lee S. Tesdell

Mediating power: Distance learning interfaces, classroom epistemology, and the gaze

DePew, K., & Lettner-Rust, H. (2009). *Computers & Composition*, 26, 174–189.

“Distance learning’s interfaces—from corresponding through the postal service to the televised talking head—have traditionally been designed from the top down, supporting banking models of learning or, in writing instruction, current traditional rhetoric pedagogies. Due to temporal and spatial constraints, these interface designs often support (or encourage) one-way communication from the instructor to the student. Students mostly interact with the instructor by asking questions or submitting work, and they tend to have little correspondence with other peers. These methods clearly privilege the instructor’s knowledge and evaluation. Furthermore, these interface designs empower the instructor to gaze upon the students and assess them—often not as a corporeal body but as a corpus of texts. Thus, each interface adopted for distance learning sets up a power dynamic in which the capability to share the roles of creating knowledge is juxtaposed with the instructor’s capability to normalize the students and reify their own authority through their gaze. In this article we examine the traditional classroom interface through the correspondence course interface, the simulated classroom interface, and the synchronous video interface to raise questions about the infrastructures of distance learning and their implications for student learning.”

Daniel Drahnak

Practitioners’ views about the use of business email within organizational settings: Implications for developing student generic competence

Zhu, Y., & White, C. (2009). *Business Communication Quarterly*, 72, 289–303.

“Although extensive research has been done on teaching emails and on the use of emails in organizations, little research exists about how to incorporate organizational practitioners’ views as the voices of the community of social practice. To remedy this pedagogical gap, this article uses a genre approach

to discuss organizational practitioners' views on the use of email in organizational settings. It also develops seven teaching and learning stages for situated learning and teaching in business communication based upon the presented study findings."

Joseph A. Dawson

Student ethos in the online technical communication classroom: Diverse voices

Pickering, K. W. (2009). *Technical Communication Quarterly*, 18, 166–187.

"As teaching technical writing online becomes more widespread, teachers and scholars are identifying ways to increase teaching/learning efficacy. One way of accomplishing this goal is by continually reflecting on different types of student ethos being constructed in an online course. The changes that occur in the ethos development process can be contextualized through activity theory, which emphasizes the dynamic, evolving nature of social environments. Activity theory's focus on cultural history and tools makes it ideal for exploring active communication among multiple participants in an online technical communication environment. The triangle of human activity adapted and developed by Engeström (1987) provides a framework for exploring ethos as an object within an online course's activity system."

Valerie J. Vance

Trends in industry supervisors' feedback on business communication internships

Sapp, D. A., & Zhang, Q. (2009). *Business Communication Quarterly*, 72, 274–288.

"The purpose of this empirical study is to explore expectations of industry insiders and identify how student interns are performing in relation to those expectations as defined by 11 performance areas While the results suggest that student interns tend to meet their supervisors' expectations in many areas, performance categories such as initiative, writing skills, and oral communication skills require increased attention in the ways we prepare students for their internships and post-graduation employment and,

perhaps, the ways we help onsite supervisors develop expectations for and evaluate our interns."

Joseph A. Dawson

Using online corpora to develop students' writing skills

Gilmore, A. (2009). *ELT Journal*, 63, 363–372.

"Large corpora such as the British National Corpus and the COBUILD Corpus and Collocations Sampler are now accessible, free of charge, online and can be usefully incorporated into a process writing approach to help develop students' writing skills. This article aims to familiarize readers with these resources and to show how they can be usefully exploited in the redrafting stages of writing to both minimize the teachers' workload and encourage greater cognitive processing of errors. An exploratory investigation comparing the use of these two online corpora in Japanese university writing classes is then described. This suggests that the participants in the study were able to significantly improve the naturalness of their writing after only a 90-minute training session and that the majority of students found these online resources beneficial, although there was a marked preference for the COBUILD Corpus and Collocations Sampler."

Lee S. Tesdell

Information Management

Best practices from the outside in

Clark, S. (2009). *Best Practices*, 11, 93–95. [Center for Information-Development Management]

The author discusses "a small technical documentation group in a content management company and how they made the move to DITA (Darwin Information Typing Architecture)."

Sherry Southard

Content management on the other side of the fence: Copyright and licensing controls

Minard, R. (2009). *Best Practices*, 11, 98–103. [Center for Information-Development Management]

This article will “assist you and your organization with managing some of the issues and emotions associated with publishing electronically [and] work through some of the issues associated with protecting copyright for publications distributed in electronic formats both by download and on physical media.”

Sherry Southard

Devising collective knowledges for the technical writing classroom: A course-based approach to using Web 2.0 Writing technologies in collaborative work

Rice, J. A. (2009). *IEEE Transactions on Professional Communication*, 52, 303–315.

“Technical and professional writing pedagogies have traditionally understood collaborative writing as an aggregate, cooperative venture between writers and subject matter experts. In contrast, this tutorial argues that Web 2.0 technologies offer technical and professional communication pedagogies more advantageous conceptions and practices of collaborative writing. The tutorial analyzes how new media technologies create a different collaborative writing environment and then discusses how these environments help collaborative writing methods create an alternative writing situation. The study concludes by examining the outcomes of student Web 2.0 research projects and by offering technical and professional writing instructors new pedagogical strategies for teaching collaborative writing.”

Gowri Saraf

Examining the information economy: Exploring the overlap between professional communication activities and information-management practices

St. Amant, K., & Ulijn, J. M. (2009). *IEEE Transactions on Professional Communication*, 52, 225–228.

“The information economy is based on the collection and the exchange of data and ideas. We all either contribute to or use materials from the information economy in most aspect of our everyday lives. Few of us, however, understand all the nuances of the information economy or the communication factors that affect its operations [This special issue] examines the connections between communication technologies and the products, practices, and services that constitute the information economy. In their introduction, the authors describe what they call ‘information economy’ and its expansion, citing sources.”

Gowri Saraf

Going global: A case study of rhetorical invention, packaging, delivery, and feedback collection

Melton, Jr., J. H. (2009). *IEEE Transactions on Professional Communication*, 52, 229–242.

“When the primary aim of global, professional communication expands to include rapport building in addition to information sharing, basic parts of the communication process must be reevaluated. Such an assessment was conducted through a case study of a team that adapted a U.S. training seminar for a Japanese audience. The team’s strong emphasis on the communicative aim of relationship building illustrated how traditional conceptions of rhetorical invention, packaging, delivery, and feedback collection might be revised. For practitioners and educators, the findings of this case study prompt a reevaluation of the rhetorical abilities that are required in global professional communication contexts.”

Gowri Saraf

How do you spell G-R-A-N-U-L-A-R-I-T-Y?

Showers, K. (2009). *Best Practices*, 11, 86–88. [Center for Information-Development Management]

To understand granularity, the author “examined the specific needs of not only our clients and their staff, but our managers, program developers, Information Architect, editors, and writers Looking from the outside in gave us the perspective we needed.”

Sherry Southard

Integrating cost effective information in a global organization

Brinck, K. (2009). *Best Practices*, 11, 77, 81–85. [Center for Information-Development Management]

The author shares “some of [her] experiences from the GECM [Global Enterprise Content Management] integration in several companies throughout USA and Europe, focusing on the processes and interaction [they] implement in the analysis, structuring, and creation of the information to give a ... view of different aspects of this integration and dive into the details to illustrate these aspects.”

Sherry Southard

Legal and ethical issues of the corporate blogosphere

Strother, J. B. (2009). *IEEE Transactions on Professional Communication*, 52, 243–253.

“In the increasingly competitive global economy, corporations throughout the world must take advantage of all the marketing and communication tools available to them, including blogging. Blogs allow corporations to connect with their stakeholders in a more personal way and, thus, strengthen their image, brand, and customer loyalty. Instant feedback is available through comments posted on the corporate blog, saving organizations large sums of money otherwise spent on market research. However, entering the blogosphere poses a number of risks for a corporation, such as potential damage to the corporate reputation and customer loyalty as well as legal liability. Conflicts still exist between the rights of bloggers and a corporation’s

interests. Blogs may be restricted by legal and ethical boundaries, which may differ across countries. This paper presents the benefits and risks associated with corporate blogging around the world and provides some interesting success stories as well as lessons learned. It also offers a compilation of guidelines for effective blogging and suggests topics for future research.”

Gowri Saraf

Micro factors influencing the attitudes toward and the use of a mobile technology: A model of cell-phone use in Guinea

Kaba, B., N'Da, L., Meso, P., & Mbarika, V. W. A. (2009). *IEEE Transactions on Professional Communication*, 52, 272–290.

“Previous studies have often highlighted macro factors as explaining the adoption and use of cell phones in developing economies. However, micro factors, which directly affect the end user’s motivations, have been underinvestigated. We examine the influence of micro factors on both individuals’ attitude toward and their use of cell phones Results show that mobility, familiarity, social influence, and resources possession influence the attitude toward and the use of cellular telephones. In contrast, the hypothesis that subscription conditions are the main influence on cell phone use is not verified.”

Gowri Saraf

Moving into someone else’s single sourcing house: Are we (best) practicing what we preached?

Sandler, H. (2009). *Best Practices*, 11, 89–92. [Center for Information-Development Management]

The author describes how an Integration department moved from having been “involved in the decision making, the testing, the changes, and the training ... [to an environment where] the tools had already been chosen, the power users had already been trained, the high-level organization of information had already been done [as they learned to use] ST4 as a documentation tool.”

Sherry Southard

Targeting an audience of robots: Search engines and the marketing of technical communication business websites

Killoran, J. B. (2009). *IEEE Transactions on Professional Communication*, 52, 254–271.

“This paper explores the extent to which technical communication businesses with Web sites are attempting to reach an audience of prospective clients through an intermediary audience of search engines. It draws on a survey of 240 principals of these businesses, brief interviews with half of them, and an analysis of their sites. Results show that search engines are among the most helpful methods leading people to these business sites and that higher levels of such search engine helpfulness are strongly associated with higher percentages of clientele who originate through these sites. Most businesses take search engines into account at least minimally; however, meaningfully pursuing that audience requires ongoing investments that some technical communication businesses are reluctant to make.”

Gowri Saraf

Using microformats: Gateway to the semantic web [tutorial]

Stolley, K. (2009). *IEEE Transactions on Professional Communication*, 52, 291–302.

“This tutorial explains and describes the use of several microformats, which make information marked up in HTML available for use in applications outside traditional Web browsers. Because microformats consist of minor additions to the HTML backbone of common Web pages, they represent a simple but significant move toward what Tim Berners-Lee has called the ‘SemanticWeb’—but without requiring the technical and practical shifts and time demands of a complete XML-based semantic Web development approach. Microformats also provide technical communicators with literacies and a conceptual foundation to approach more advanced semantic Web technologies and suggest ways to refine current Web design practice.”

Gowri Saraf

Management

A content analysis investigating relationships between communication and business continuity planning

Adkins, G. L., Thornton, T. J., & Blake, K. (2009). *Journal of Business Communication*, 46, 362–403.

“This study provides an exploratory content analysis of business continuity planning (BCP) literature. The researchers systematically sampled multiple databases and codified artifacts using a set of variables developed by the research team. Based on the analysis, arguments are presented concerning the nature of BCP, the state of the BCP literature, and the nature of the conversations taking place in regard to BCP among academics, government/legal institutions, the media, and trade industries. Finally, the researchers demonstrate gaps in the current knowledge on BCP and suggest future directions for applied and theoretical research.”

Joseph A. Dawson

Listen for the answers

McCasland, R. (2009). *Communication World*, 26(4), 36–38.

“Global employee engagement survey results released by the IABC Research Foundation reveal opportunities for communicators to have greater influence on delivering messages that encourage employees to remain productive, and to understand how their work contributes to achieving organizational priorities [Use of social media] is not the solution to effective employee engagement” but provides more tools for employee communication, including listening to employees’ perceptions about workplaces.

Linda M. Davis

Principles for effective virtual teamwork

Numamaker, Jr., J. F., Reinig, B. A., & Briggs, R. O. (2009). *Communications of the ACM*, 52(4), 113–117.

“Virtual teamwork is different than face-to-face teamwork in many ways so it takes overt and explicit effort to design new work processes to make it

successful. The biggest challenges for virtual team members are competing demands for attention, ambiguity of remote communication, establishment of personal relationships, and the need for accessible, stable, and user-friendly technology. The [nine] principles presented here are drawn from our experience with virtual teams across numerous organizations and are the result of many successes and failures. The principles are intended to help designers, managers, and virtual team members improve the effectiveness of their virtual team."

Sherry Southard

The role of leader motivating language in employee absenteeism

Mayfield, J., & Mayfield, M. (2009). *Journal of Business Communication*, 46, 455–479.

"This study investigates the relationship between strategic leader language (as embodied in Motivating Language Theory) and employee absenteeism. With a structural equation model, two perspectives were measured for the impact of leader spoken language: employee attitudes toward absenteeism and actual attendance. Results suggest that leader language does in fact have a positive, significant relationship with work attendance through the mediation effect of worker attendance attitude."

Joseph A. Dawson

Professional Issues

The Association of Teachers of Technical Writing: The emergence of professional identity

Kynell, T., & Tebeaux, E. (2009). *Technical Communication Quarterly*, 18, 107–141.

"This article attempts to summarize the history of ATTW. It focuses on issues that led to the need for an organization devoted to technical writing, and the individuals who were leaders in ATTW, as well as in NCTE and CCCC, whose efforts provided the

foundation for the presence of technical writing as a legitimate teaching and research discipline. We draw on existing historical pieces and the contributions provided by many of the first ATTW members to capture the history of ATTW. We describe the major changes in ATTW from 1973–2007 and conclude with our reflections, as well as important questions we believe to be critical to the future of ATTW."

Valerie J. Vance

Breaking the chain of command: Making sense of employee circumvention

Kassing, J. W. (2009). *Journal of Business Communication*, 46, 311–334.

"This study explores how employees accounted for their engagement in circumvention (i.e., dissenting by going around or above one's supervisor). Employees completed a survey instrument in which they provided a dissent account detailing a time when they chose to practice circumvention. Results indicated that employees accounted for circumvention through supervisor inaction, supervisor performance, and supervisor indiscretion. In addition, findings revealed how employees framed circumvention in ways that enhanced the severity and principled nature of the issues about which they chose to dissent."

Joseph A. Dawson

Exit, voice, and sensemaking following psychological contract violations: Women's responses to career advancement barriers

Hamel, S. A. (2009). *Journal of Business Communication*, 46, 234–261.

"Much of the theory guiding career development research is grounded in studies of men's careers in professional positions. In addition to largely ignoring the career experiences of women, the career literature pays little attention to overcoming barriers to career advancement in organizations—a challenge many women and men both face over the course of their career development. Using survey data, analyses of in-depth interviews, and a focus group discussion with female executives in the high-tech industry, this study finds variations of three responses: exit, voice,

and rationalizing to remain are used by women in response to career barriers. These responses form the foundation of a career barrier sensemaking and response framework presented in the study. Findings indicate that perceived organizational sanctioning of career barriers and the organization's commitment to the career advancement of other women also influence participants' responses to barriers and their strategies for sensemaking, respectively."

Joseph A. Dawson

Time to socialize: Organizational socialization structures and temporality

Gómez, L. F. (2009). *Journal of Business Communication*, 46, 179–207.

"Organizational socialization is a communicative practice that affects and is affected by organizational temporality. The relationship between organizational socialization practices and organizational temporality is empirically explored through a questionnaire focusing on Ballard and Seibold's temporality dimensions and measures emphasizing structural dimensions of socialization tactics. Findings indicate that the perception of time as scarce is related to organizational members' development of formal structures that promote socialization of newcomers. Further, findings suggest that organizational members holding a future temporal focus may engage in the development of formal socialization structures that provide social support for newcomers and help newcomers predict their career path within the organization."

Joseph A. Dawson

Publishing

Book history in premodern China: The state of the discipline I

Brokaw, C. J. (2007). *Book History*, 10, 253–290.

In this bibliographical essay, the author surveys scholarly studies of book production (chiefly xylographic) in China from roughly the 8th to the 18th centuries. She divides her survey into six categories: the study of books

and printing, the search for China's print revolution, patterns of book production and distribution, the impact of print on society, publishing and the state, and reading practices. Of particular interest is her summary of the debates about when a printing "revolution" might have taken place in China. The author concludes her survey with suggestions for future research—for example, calling for comparative studies of China's book culture with other book cultures.

Edward A. Malone

Research

The linguistic representation of rhetorical function: A study of how economists present their knowledge claims

Dahl, T. (2009). *Written Communication*, 26, 370–391.

"This article deals with how economists present their new knowledge claim in the genre of the research article. In the discipline of economics today, the claim is typically included not only in the obvious results/discussion section(s) but also in three other locations of the article: the abstract, the introduction, and the conclusion. The present study considers whether the rhetorical function of each of these three text parts has an impact on the linguistic realization of the claim. The corpus consists of 25 articles from two international journals, *European Economic Review* and *Journal of International Economics*. The investigation shows that economist authors commonly draw their readers' attention to the claim by means of signaling expressions such as *Our main finding is that ...*, not only in the introduction but also in the conclusion. The simple present seems to be the preferred tense in the claim sentence, even in the conclusion (*We find ... / We argue ...*). The discussion of these findings includes the views of discipline insiders, providing clear indications of the strategic nature of the research communication process."

Tim Hadley

Scientific Writing

Beyond the screen: Narrative mapping as a tool for evaluating a mixed-reality science museum exhibit

Kitalong, K. S., Moody, J. E., Middlebrook, R. H., & Ancheta, G. S. (2009). *Technical Communication Quarterly*, 18, 142–165.

“This article describes the authors’ work as formative evaluators of a mixed-reality science museum installation, Journey with Sea Creatures. Looking beyond the focal point of the screen to the spatial and temporal surroundings of the exhibit, the authors employed a technique they call retrospective narrative mapping in conjunction with sustained onsite observations, follow-up interviews with museum visitors, and the development of personas to better understand the user experience in multimodal informal learning environments.”

Valerie J. Vance

Confronting rhetorical disability: A critical analysis of women’s birth plans

Owens, K. H. (2009). *Written Communication*, 26, 247–272.

“Through its analysis of birth plans, documents some women create to guide their birth attendants’ actions during hospital births, this article reveals the rhetorical complexity of childbirth and analyzes women’s attempts to harness birth plans as tools of resistance and self-education. Asserting that technologies can both silence and give voice, the article examines women’s use of technologies of writing to confront technologies of birth. The article draws on data from online childbirth narratives, a childbirth writing survey, and five women’s birth plans to argue that women’s silencing, or rhetorical disability, during childbirth both prompts and limits the birth plan as an effective communicative tool. The data suggest that the birth plan is not consistently effective in the ways its authors intend. Nonetheless, this analysis also demonstrates that the rhetorical failure of the birth plan can be read as, and thereby transformed into, rhetorical possibility.”

Tim Hadley

Ethical or unethical persuasion? The rhetoric of offers to participate in clinical trials

Barton, E., & Eggly, S. (2009). *Written Communication*, 26, 295–319.

“Based on a sample of 22 oncology encounters, this article presents a discourse analysis of positive, neutral, or negative valence in the presentation of three elements of informed consent—purpose, benefits, and risks—in offers to participate in clinical trials. It is found that physicians regularly present these key elements of consent with a positive valence, perhaps blurring the distinction between clinical care and clinical research in trial offers. The authors argue that the rhetoric of trial offers constructs and reflects the complex relationships of two competing ethical frameworks—contemporary bioethics and professional medical ethics—both aimed at governing the discourse of trial offers. The authors consider the status of ethical or unethical persuasion within each framework, proposing what is called the best-option principle as the ethical principle governing trial offers within professional medical ethics.”

Tim Hadley

Gestural enthymemes: Delivering movement in 18th- and 19th-century medical images

Newman, S. (2009). *Written Communication*, 26, 273–294.

“This article contributes to recent efforts to add life and movement to rhetorical studies by focusing on the representation of movement in medical texts. More specifically, this study examines medical texts, illustrations, and photographs involving movement. . . . By identifying how figures of speech epitomize arguments, this examination follows a shift in the way arguments about movement are represented, a shift from static, visual arguments to gestural enthymemes, as they are named, arguments that are made in movements; these shifts are linked to developments in medical technologies involving photography. These arguments about and using movement attempt to ‘capture’ or express the moments within which life, through the embodied gesture, resides. This extended understanding of the enthymeme broadens current

understanding of argument to include delivery, links medical and rhetorical discursive practices, and informs how we make sense of and study the relationships between technology and rhetoric both in the past and present.”

Tim Hadley

A grounded investigation of genred guidelines in cancer care deliberations

Teston, C. B. (2009). *Written Communication*, 26, 320–348.

“Genred documents facilitate collaboration and workplace practices in many ways—particularly in the medical workplace. This article represents a portion of a larger grounded investigation of how medical professionals invoke a wide range of rhetorical strategies when deliberating about complex patient cases during weekly, multidisciplinary deliberations called Tumor Board meetings. Specifically, the author explores the role of one key document in oncological practice, the Standard of Care document. Each Standard of Care document (one for every known cancer) presents a set of national guidelines intended to standardize the treatment of cancer. Tumor Board participants invoke these guidelines as evidence for or against particular future action. In order to better understand how genred, generalizable guidelines like Standard of Care documents afford decision making amid uncertainty, the author conducts a temporal and contextual analysis of the document’s use during deliberations as well as a modified Toulminian analysis of a representative sample. Results suggest that, while on its own the document achieves an authoritative, charter-like purpose, it fails to make explicit a link between individual patients’ experiences and the profession’s expectations for how to act. Implications for how genred, generalizable guidelines—given the way they encourage certain ways of seeing over others—organize and authorize work are discussed, and a modified Toulminian approach to understanding the relationship between claim and evidence in multimodal texts is modeled.”

Tim Hadley

Internet health and the 21st-century patient: A rhetorical view

Segal, J. Z. (2009). *Written Communication*, 26, 351–369.

“Internet health—here, the public use of information Web sites to facilitate decision making on matters of health and illness—is a rhetorical practice, involving text and trajectories of influence. A fulsome account of it requires attention to all parts of the rhetorical triangle—the speaker, the subject matter, and the audience—yet most scholarship on Internet health focuses on the speaker only: it typically raises concerns primarily about the dangers of unreliable sources, suggesting that, where speakers are reliable and information is accurate, Internet health simply empowers patients. This essay turns attention to the other elements of the triangle. It argues that health information is a complex entity—not only transmitted but also transformed by the Web—and, further, that Internet-health users are a complex audience—not only informed but also transformed by the Web. Rhetorically-minded researchers are well positioned to study not simply the informed patient but rather, more comprehensively, the wired one.”

Tim Hadley

Lydia J. Roberts’s nutrition research and the rhetoric of “democratic” science

Jack, J. (2009). *College Composition and Communication*, 61, 109–129.

“This article examines nutritionist Lydia J. Roberts’s use of the ‘democratic approach’ as a rhetorical strategy both to build solidarity among scientists and to enact participatory research in a rural Puerto Rican community. This example suggests that participatory scientific methodologies are not necessarily democratic but may function rhetorically to serve nondemocratic purposes.”

Brent Henze

The trial of the expert witness: Negotiating credibility in child abuse correspondence

Schryer, C. F., Afros, E., Mian, M., Spafford, M., & Lingard, L. (2009). *Written Communication*, 26, 215–246.

“This article reports on forensic letters written by physicians specializing in identifying children who have experienced maltreatment. These writers face an extraordinary exigency in that they must provide an opinion as to whether a child has experienced abuse without specifically diagnosing abuse and thus crossing into a legal domain. Their credibility was also at issue because, in this jurisdiction, child abuse identification was not recognized as a medical subspecialty and because the status of expert witnesses is currently being challenged. Through an analysis of 72 forensic letters combined with interview data from six letter writers and five letter readers, we determined that these writers used linguistic and rhetorical strategies that allowed these letters to function as boundary objects or objects that traverse several communities of practice. The most salient strategy was the use of evaluative lexis—adjectives and adverbs which allowed for a range of interpretations and constrained those interpretations at the same time.”

Tim Hadley

Technology

Ballot box communication in online communities

Xia, M., Huang, Y., Duan, W., & Whinston, A. B. (2009). *Communications of the ACM*, 52(9), 138–142.

“The participation of individual users in online communities is one of the most noted features in the recent explosive growth of popular online communities ranging from picture and video sharing ... and collective music recommendation ... to news voting ... and social bookmarking Unlike traditional online communities, these sites feature little message exchange among users Recognition of this new type of user participation is crucial

to understanding the dynamics of online social communities and community monetization. The new communication features in online communities can be best summarized as Ballot Box Communication (BBC), which is an aggregation mechanism that reflects the common experience and opinions among individuals Simplification, the many-to-one nature, and implicit influences on users are three major characteristics of BBC compared with CMC (Computer Mediated Communication).”

Sherry Southard

A blind person's interactions with technology

Shlnohara, K., & Tenenberg, J. (2009). *Communications of the ACM*, 52(8), 58–66.

“The study described here is an in-depth exploratory and descriptive case study of a blind individual using various technologies in her home. Previous studies in lab settings compared interactions against a set of heuristics or with a control group, allowing researchers to isolate events in order to understand how users interact with specific technologies on a narrow range of tasks. We took this study out of the lab and into the home to get a better sense of the nuances of everyday life influencing how a blind user interacts with technology. It differs from the usability approaches in several ways The combination of functionality and socially situated meaning determines for the user the actual usability of a technology to accomplish specific tasks. These technologies hold meaning that affects the ways individuals understand themselves in relation to the communities to which they belong.”

Sherry Southard

Get ready for Intranet 3.0

Miller, P. (2009). *Communication World*, 26(4), 32–34.

“The term [intranet] describes the integration of a range of employee-facing services delivered via technologies that are melding into the fabric of the organization. This amalgamation of deep-lying services, applications and communities is reshaping where work is done, how it is done, and the ease by

which it can be completed ... It will change the way we work.” The author discusses examples of businesses using the company intranet to drive efficiency and productivity.

Linda M. Davis

How culture influences IT-enabled organization change and information systems

Martinsons, M. G., Davison, R. M., & Martinsons, V. (2009). *Communications of the ACM*, 52(4), 118–123.

“Business process reengineering (BPR) represents a well-defined way to realize the potential benefits of information technology. ... This article develops such an understanding internationally by reporting on 12 BPR initiatives in six countries with differing cultural profiles. We first discuss the concept of national or societal culture and outline our comparative research approach. We then summarize how and why specific dimensions of culture influence both IT-enabled organizational change and the accompanying types of IS [Information Systems] before considering the implications of our findings.”

Sherry Southard



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